Vol. V. SEPTEMBER, 1896. No. 9.

MODERN MEDICINE AND BACTERIOLOGICAL REVIEW.

Bulletin of the Sanitarium Hospital and Laboratory of Hygiene.
SANITARIUM, BATTLE CREEK, MICH.

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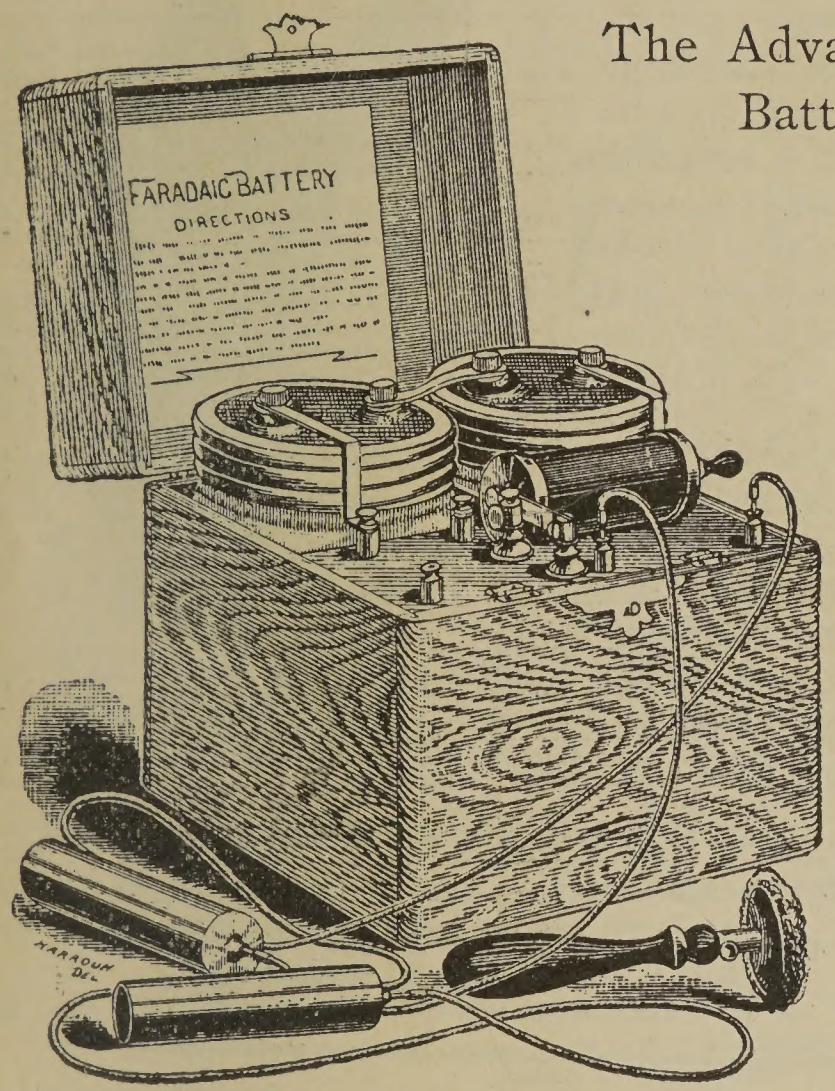

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11.25	5.05	10.30	6.00	.....	.....Valparaiso.....	5.05	11.35	7.10	.....	4.30
p m										
1.05	6.30	12.00	10.05	.....	.....South Bend.....	3.10	10.15	5.44	.....	3.07
1 46	7.12	12.45	12.40	.....	.....Cassopolis.....	2.15	9.40	5.13	.....	2.25
2.33	.....	†1.33	3.42	.....	.....Schoolcraft.....	1.20	.....	.....	.....	.....
2.44	7.55	1.48	4.30	a m	.....Vicksburg.....	1.10	8.52	.....	p m	1.30
3.30	8.36	2.40	6.20	7.00	.....Battle Creek.....	12.15	8.15	3.55	9.35	12.50
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9.50	1.00	7.30	.....	12.05	.....Tunnel.....	6.50	3.50	11.55	3.50	7.55
	p m					a m	a m	a m	p m	p m
9.25	.....	.....	.....	.....	.....Detroit.....	.....	.....	10.40	4.05	8.00
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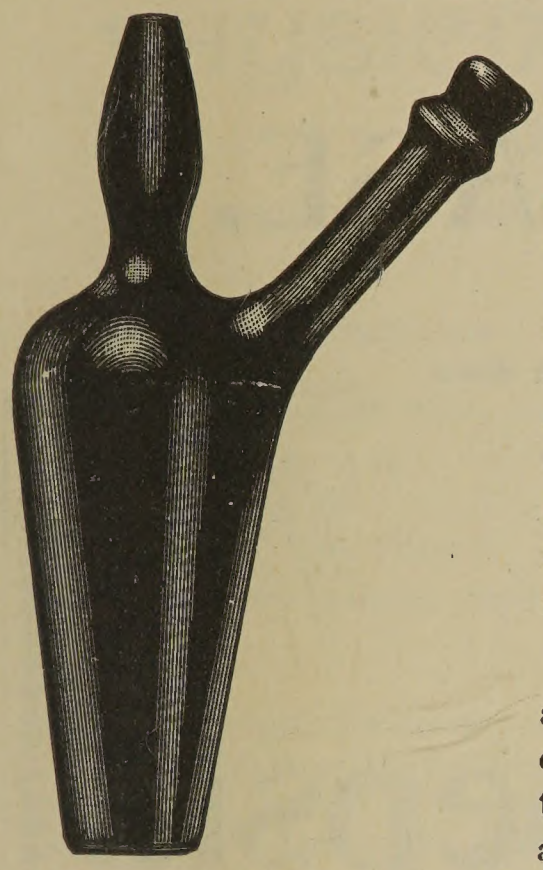

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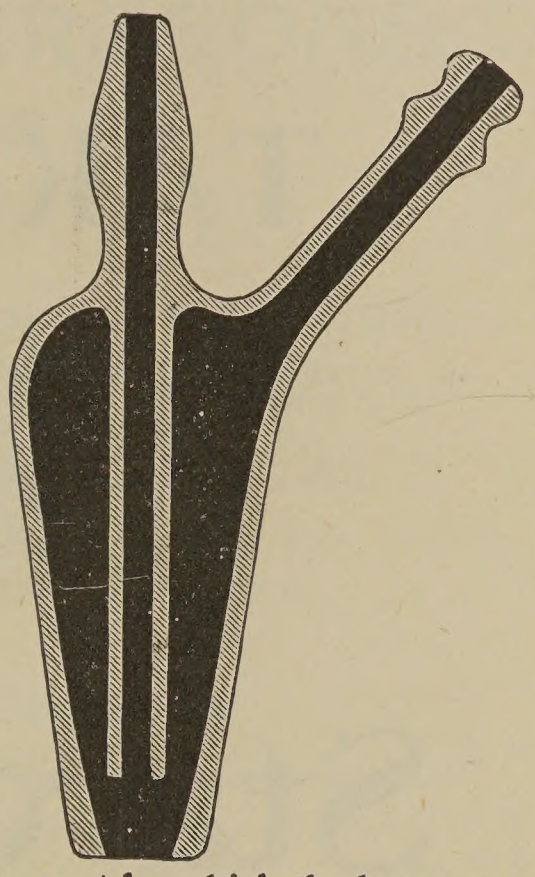

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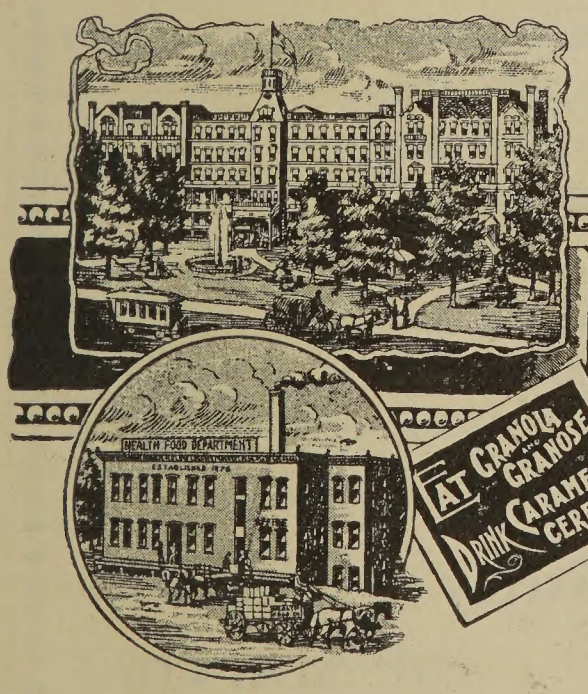

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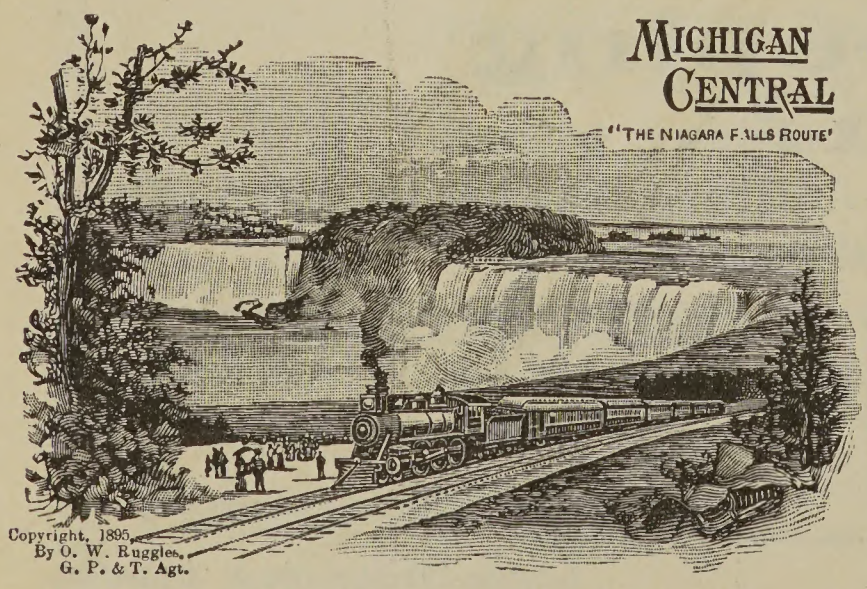

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BACTERIOLOGICAL REVIEW.

VOL. V. BATTLE CREEK, MICH., U. S. A., SEPTEMBER, 1896. NO. 9.

ORIGINAL ARTICLES.

SCOLIOSIS AND ITS TREATMENT BY MEANS OF GYMNASTICS.

BY DR. T. J. HARTELIUS.

Translated by Dr. David Paulson.

DEFINITIONS AND SUBDIVISIONS.

PERMANENT lateral curvature of the spinal column is termed scoliosis. If this condition is the result of a primary affection of the muscles, it is called *scoliosis muscularis;* if it results from a primary affection of the bones, it is called *scoliosis ossicularis.* It is clear that, whether the first cause lies in the muscles or in the bones, disease of the bones or muscles will follow secondarily, if the primary affection is not removed. If the classification of cases of scoliosis were based upon its primary cause, a new classification would have to be made; because there are a number of diseases which give rise to this condition. Disease in the vertebral cartilages or in the ligaments may produce it, or it may result from pleuritic exudate. But as it is only occasionally that scoliosis arises from these causes, such a classification would be of but little value for the correct comprehension of the disease. The only classification which is necessary is to consider it under the two heads above mentioned,— muscular scoliosis and ossicular scoliosis.

SYMPTOMS, COURSE, AND PATHOLOGICAL AND ANATOMICAL CHANGES

Scoliosis is so insidious in its early stages that its first signs are often unnoticed. It is, however, important that these should not be overlooked; for, in order to prevent its progress, it is necessary to treat it in the beginning. The least asymmetry in the position of the shoulders or the hips should suggest the importance of an examination to find out if there is not an incipient deviation from the normal in some portion of the spinal column. Of course it is possible that the shoulders as well as the hips may, from mechanical causes or disease, have an abnormal position without being connected with an incipient scoliosis. This, however, may be readily detected by examination. Careful examination by means of sight, measurement of the trunk, of the extremities, and of corresponding parts, should readily lead to the detection of scoliosis, even in its earliest stages.

Some authors, as Jalade-Lafond, Büring, Bouvier, Sabatier, and others, hold the opinion that there is, in certain individuals, a physiological right lateral curvature. Hyrtl accepts this idea, but considers the deviation so minute that only a trained eye can detect it. Sabatier and Jalade-Lafond consider the pulsations of the descending aorta as a cause for this curvature, while Büring considers the heart-beat as the cause. I have not been able to establish the presence of such a curvature, although I have had under observation a large number of students, furnishing abundant material for investigation. There are, however, noted authors who oppose the idea that such a curvature exists. M. Eulenburg denies it in the most decided manner, and says that every permanent lateral curvature must be considered as pathological.

Scoliosis is quite regular in its course of development, which, from a pathological point of view, may properly be divided into three stages. When a curvature first appears in any part of the spinal column, or, as is most common,

in the dorsal or lumbar region, it is in its first stage. The characteristic symptom of this stage is that the patient can voluntarily assume an erect poise, the curvature also disappearing when he takes a horizontal position. The patient is able to maintain the spinal column erect, however, only for a short time, and hence he will very soon resume his former position. The curvature is pathological, and there is no good ground for calling this stage a mere *tendency* to scoliosis.

A primary curvature is sooner or later followed by a compensation curvature, when the scoliosis may be said to have entered its second stage, and the curvature has become S-shaped. Not rarely there also occurs a compensating curvature in the neck and sacral region, so that the spinal column forms a wave-like curve laterally, which is commonly longest and deepest in the dorsal region. Frequently, however, there occurs a primary dorsal or lumbar curve with the convexity to the left, which may exist for some time without any noticeable compensation curve. In practise, the latter are considered and treated as single curvatures. The single curvature is, however, more apparent than real; because, upon thorough examination, there will commonly be found a counter-curve either in the neck or the sacral region, or in both. The characteristic of the second stage of scoliosis is the rotation of the vertebral bodies on their long axes, with the spinous processes toward the concave side, and the bodies toward the convex side. In a permanent lateral curvature, the rotation of the vertebral bodies is accompanied by a change in their form and in the form of the vertebral cartilages, as well as in the relative position of the ribs, clavicle, and shoulder-blade.

With this deformity, scoliosis has reached its third stage, but it will develop further if it is allowed to proceed. The length of time necessary for it to develop differs in different individuals, and undoubtedly depends partly upon the surroundings, and partly upon the difference in the quality of the vertebral cartilages and bony substances of the vertebræ. The degree of the spinal curvature determines, of course, the degree of deformity in the adjacent parts.

The characteristics of this deformity, and the pathological changes in scoliosis, as observed by Cruveillier, furnish interesting information. A post-mortem examination was made upon a scoliotic spinal column, with the convex side to the right from the third to the eleventh dorsal cartilages, which presented the following deviations: The bodies on the convex side measured 222 millimeters in height, and on the concave, 215, the difference between the two sides being seven millimeters. The height of the first eight vertebral cartilages upon the concave side was forty-five millimeters, and upon the convex side, sixty-five, thus showing a difference of twenty millimeters. The ninth, tenth, and eleventh dorsal vertebræ were all of equal height on both sides. On the contrary, however, the corresponding vertebral cartilages were, on the convex side, twenty-eight millimeters, and on the concave side only sixteen millimeters in height. The proportion existing between the height of the vertebral bodies on the concave side and that on the convex side was as 9 is to 10, and the proportion existing between the height of the vertebral cartilages was as 5 is to 10. The deformity in the lumbar curve upon the same body was yet more apparent. The height of the vertebral cartilages on the concave side was to the height on the convex side in the proportion of 6 to 18. In the corresponding vertebral bodies, the height of the concave as compared with the convex side was in the proportion of 17 to 19. The cartilages between the second and third lumbar vertebræ had entirely disappeared upon the concave side, and the two vertebral bodies were completely ankylosed.

This case shows that in the advanced stages of curvature a wedge-shaped change takes place, first in the vertebral cartilages, and later, on account of the pressure, in the vertebral bodies. The greatest deformity takes place in those vertebral cartilages and bodies which form the center of the pathological curvature, and decreases gradually toward the ends of the curve.

Dr. Eulenburg says that post-mortem examinations establish the fact that in well-marked lateral curvatures, where the vertebral cartilages have been absent for some time, there often arises an ankylosis of the vertebral bodies through synostosis, or ossification.

Accompanying the lateral curvature of the spinal column is a necessary change

in the normal position of the ribs. Upon the convex side they protrude, and through a marked bending and rotation of the vertebræ they often acquire an arched appearance, as though there were a complication of kyphosis; but this is not really the case. The ribs arch out at their vertebral ends, and are separated from each other and flattened upon their sternal ends. The opposite condition is found in the ribs upon the concave side, which, on their vertebral ends, are crowded nearer together, flattened, and often synostosed. On the sternal ends they arch forward. A scoliotic thorax, however, differs from the regular thorax of diminished capacity.

A counter-curve in the lumbar region contributes also to the diminishing of the chest capacity, through the pushing up of the false ribs upon the convex side. In rachitic scoliosis existing in a high degree, the ribs and the costal cartilages are usually depressed so that the sternum protrudes, presenting the characteristic "pigeon breast."

A very conspicuous abnormal position of the shoulders takes place in scoliosis. Upon the convex side, the shoulder-blade is generally higher, its lower angle protruding; on the concave side, it is lower, and, as it were, pushed forward upon the ribs. In treatment, it is very important to differentiate this mechanical dislocation of the shoulder-blade from one which is dependent upon a pathological condition of the muscles, which may often be complicated with scoliosis.

The form of the pelvis undergoes certain changes in scoliosis. Every marked lumbar curvature causes an elevation of the same side of the pelvis as the concavity, and a depression upon the opposite side. Various pathologico-anatomical changes in the muscles also arise in scoliosis. These may differ much in degree and extent. In the treatment of scoliosis, it is of the greatest importance to understand these changes. In support of this opinion, I will quote several authors: —

J. Delpech says: "The muscles which are situated upon the concave side in spinal curvature show a kind of hypertrophy, and those upon the convex side, a real atrophy."

M. Eulenburg quotes Professor Günther as having found the muscles in scoliosis on the convex side relaxed, of a pale color, and poorly nourished; those upon the concave side shortened, though not retracted, of the proper color, of normal nutrition, and capable of extension.

Dr. Bouland, in the post-mortem examination of a man forty-five years of age who had been afflicted with rachitic scoliosis, found the muscles upon the convex side thin, pale, and mixed with a considerable amount of fibro-cellular substance in connection with the muscle substance. In numerous places in those muscles, fatty degeneration had set in; the muscle fibers showed a large number of fine granulations under microscopical examination. The cross-striæ were absent in some of the muscle groups; upon the concave side the muscle groups were firmer, shortened, of normal color, and capable of relaxation.

M. Eulenburg examined the muscles of the body of a scoliotic girl aged eleven, who had died of an acute disease. The scoliosis had begun three years previously, and had reached the beginning of the third stage; viz., "an upper curve, with the convexity to the right from the third to the ninth dorsal cartilages." The highest departure from the median line, in the convexity, was two centimeters. In the lower curve, with the convexity to the left, involving the twelfth dorsal and all the lumbar vertebræ, the distance from the median line to the highest point of convexity was one and one-fourth centimeters. All the pathognomonic signs of rachitis were absent. Examination of the muscles showed the following: Upon the convex side, the longissimus dorsi and the multifidæ spinæ were pale in color, poorly nourished, and relaxed. The corresponding muscles upon the concave side of both curves were shortened, though capable of relaxation, and of nearly normal size and very slightly diminished color. The rhomboidal muscle upon the right side was more poorly nourished and paler than that upon the left side. Upon neither side was there any fatty degeneration of the muscles.

It is beyond all doubt that the muscles are weakened upon the convex side in scoliosis. We have a further confirmation of this in a similar condition in other abnormal conditions, such as pes equinus varus and valgus. Dittel says that in these abnormalities he has constantly found that the muscles of the convex side are pale, poorly nourished, with partial fatty degeneration, and relaxed,

while those of the concave side are contracted, better nourished, and nearly normal in color. The highest degree of deformity and disproportion between the two sides has been pointed out by Engel, who named it "paralytic thorax." Here, not only the skeleton and muscles undergo great changes, but there is also a displacement, and functional disturbances are set up in the circulatory, respiratory, and digestive organs (Bouvier).

So far as the influence of scoliosis upon the general health is considered, it may be said that it is usually not disturbed in the first stages by the local affection, and it is not unusual to find the health maintained, even in the more marked types of scoliosis.

It has been believed, and many have consoled themselves with the idea, that a scoliosis should, at least in its early stages, correct itself. This is directly opposed to experience, and the real truth, which cannot be denied, is that a well-defined scoliosis never of its own accord returns to a normal state; much less can this be expected in the more advanced stages. The other question is, Does the scoliosis, of its own accord, remain in one of its stages without further development? This has happened, and not infrequently occurs under favorable conditions; but it being entirely uncertain that such will be the case, not to seek help as soon as the scoliosis appears is an unjustifiable neglect.

Scoliosis proceeds with quite definite and characteristic symptoms. In 574 cases of the S-form of scoliosis, only five had the upper convexity on the left, and the lower convexity on the right. The remainder had the upper and greater curvature to the right, and the lower to the left. The upper curvature generally limits itself to the dorsal vertebræ, while the lower is confined to the lumbar vertebræ; and only in a very few cases did the lower dorsal vertebræ help to form the lower curve. Occasionally there could be found, in addition to the greater curvature, a smaller one in the cervical or the sacral region, or in both.

In 326 cases the spinal column had only the single, well-defined curve, but in a number there were found slight indications of a secondary counter-curve. The secondary curve follows the primary in a greater or less time, but not infrequently the single curvature may remain alone for a considerable length of time. The secondary curve is most commonly limited to the lumbar vertebræ, but occasionally involves several of the dorsal vertebræ. In these cases the curve will be of considerable length, although not very well marked as to depth. Of 326 cases, 280 had the curvature to the left, and where an indication to a counter-curve could be observed, it was to the right, and would thus, when fully developed, usually take the S-form. In forty-six cases a counter-curvature with a convexity to the right had set in.

From an observation of nine hundred cases of scoliosis, it appears that the prevailing types are of the S-form, with the upper convexity to the right and the lower to the left, and that other types may be considered as being merely exceptions to this rule. Even though the curvature may not seem to progress at some of the different stages of its development, yet it manifests a decided tendency to progress into the more advanced stages, with more or less pathologico-anatomical changes.

THE CAUSES OF SCOLIOSIS.

The definite and quite similar symptoms in different cases of scoliosis readily lead us to the conclusion, with reference to its causes, that there must be a similar uniformity with reference to the mode of operation of its causes; yet there are many conflicting opinions in regard to this question. These different opinions seem to arise from the fact that some consider that the passive parts of the body, as the bones, cartilages, and ligaments, contribute chiefly to the maintenance of the erect position of the spinal column; while other authors maintain that the shape of the vertebral bodies, together with cohesion and gravity, is the principal agent in the maintenance of the vertebral bodies in a vertical position. None of the authorities thus exclude the activity of the muscles, but they give it a subordinate place. Dr. Parow limits the influence of the muscular activity to merely bringing the point of gravity into a position of equilibrium, and then considers further activity of the muscles to be unnecessary. In proof of this idea, he refers to experiments which show that the very least force that can be exerted is sufficient to maintain the equilibrium of the spinal column,—simply the sup-

port of one finger. M. Eulenburg remarks that it is improper to apply to the living organism conclusions drawn from experiments made upon dead bodies.

The idea that the maintenance of the correct position of the spinal column is for the most part naturally mechanical, leads to the conclusion that the changes in the passive parts, as the vertebral cartilages and bodies and the ligaments, should be properly considered as the primary cause of scoliosis. To assign such a subordinate place to the activity of the muscular system, conflicts, however, with every-day experience. Why does the feeble person relax, if not as the result of the weakened muscles? The aged person is not able to maintain an erect position because his muscular power is weakened. Vigorous persons, on the other hand, maintain themselves erect by the strength of their muscles; and whatever part the shape of the vertebral bodies, their gravity or cohesion, may play in the maintenance of this attitude, active and vigorous muscles are essential. A human being is, after a night's rest, several lines taller than he was the previous evening, after having, during the course of the day, wearied his muscles by the day's activities. It would be a strange inconsistency if the muscles, with their greater relative function and higher physiological rank in other respects, should contribute so little to the support of the spinal column. They have, moreover, for this purpose, the most suitable arrangement and compensation with the spinal column and trunk.

That it is the muscles which principally uphold and maintain the spinal column in the upright position is an opinion supported by many eminent authors. Hyrtl says that as long as the muscles retain their physiological antagonism in acting upon the spinal column, so long is a permanent spinal curvature excluded. M. Eulenburg declares that the cause of scoliosis most frequently consists of a derangement of the equilibrium between the muscles of the opposite sides. A similar opinion is held by Joannes Müller, Wallentin; Lachais, Axel Ulrich, A. G. Berglind, and others. C. A. Wunderlichs states the cause of scoliosis as follows: —

"The primary cause for deviation of the spinal column may be —

"1. An anomaly in the vertebral bodies with reference to their number, origin, or structure, or their shape and consistency. This condition may be congenital, or it may be acquired through a number of different diseases, as suppurative inflammation, osteomalacia, and rarely, rachitis.

"2. In the vertebral cartilages, though rarely.

"3. Changes in the bony substances of the vertebral bodies, as deposits, necrosis, and softening.

"4. In the muscles of the back, partly through contraction, partly through paralysis of single muscles, but chiefly through the difference in power and function of corresponding muscles of the two sides."

The same author gives the following explanation for the muscular cause of scoliosis: —

"The difference in the activity of the muscles of one side, as compared with that of the other side, though very slight, will yet exert a bearing on the position of the vertebral bodies, and this will be the more marked in proportion as one side is weaker than the other. This cause for spinal deviation is one of those which occur most frequently. Lateral curvature of the spine develops very readily in individuals who have weak muscular powers, and likewise in those who do not exercise their muscles sufficiently, especially those whose bodies have not reached full development. Therefore curvatures develop in the greatest number of cases before the time when growth takes place most rapidly, and while the muscles are comparatively thin; that is, from the time of the second dentition to puberty. It is on this account that deviation from the spinal column occurs so commonly in women, and for the same reason that spinal curvatures are so rapidly formed in childhood in the case of such diseases as retard the movements, and thus the activity and nutrition of the muscles. In rachitis the curvature is not dependent upon the change of form in the vertebræ, but upon the weakened, inactive condition of the muscles. In close connection with this cause is the relaxed and careless poise of the body often acquired, either through habit or lack of training."

This lengthy quotation is given because it throws a clear and definite light upon the etiology of scoliosis.

Many different causes have been proposed by different authors for scoliosis, but I shall herewith present only those which, on account of my own observation, seem to me the most scientific.

Hereditary Tendency. — If due to heredity, the curvature will develop not merely in weak individuals, but also in those who have a vigorous constitution. Some examples have been found where scoliosis in the same form has existed in the daughter, mother, and grandmother. It seems to be a fact that this hereditary tendency is transmitted chiefly on the mother's side. This is undoubtedly true in a great many more cases than it is possible to observe. Out of 1000 scoliotic cases, M. Eulenburg found 254 in which a hereditary disposition could be traced; and of these, 249 were transmitted from the mother's side, and only five from the father's. The author remarks with all assurance that twenty-five per cent. would hardly cover the whole number, as it is embarrassing to acknowledge a deformity in the back. This hereditary tendency is simply a disposition, and is not in itself a cause of scoliosis; the usual spinal curvature indicates a definite, active cause.

Rachitis. — This disease indicates a general disturbance of nutrition, and is characterized by progressive changes in the structure, composition, and form of the bones. On account of a relative excess in amount of the organic substance of the bones, they acquire an abnormal flexibility. That in this should lie a disposition to scoliosis is plain; but long bones, not the vertebral bodies, are the parts specially affected in rachitis. Among 496 rachitic children, Jules Guerin found only eleven without a deformity of any kind in the extremities; and of the remaining 485, the deformity was found in the spinal column in only forty-eight cases. Rachitis is a disease which very rarely occurs after the age of six or seven years, while the largest number of scolioses begin after this age. The rachitic disposition is strictly limited to childhood.

Muscular Weakness. — That weakness in the muscles, in and of itself, is the cause of scoliosis, is quite plainly denied by the typical form of the common curvature; but that it is more readily acquired in individuals whose muscles are weak is confirmed by experience, a certain disposition to scoliosis lying unquestionably in weakness of the muscles. Though the majority of scoliotic patients are weak in the muscles, this is not always the case. The great difference in the number of scolioses in the two sexes shows clearly a stronger tendency to it in one sex than in the other. In my own practise, the number of scoliotic cases in men as compared with those in women, has been in the proportion of one to nine. M. Eulenburg found scoliosis in ten women to one man. This greater tendency in women toward scoliosis may well have an explanation in their peculiar physical constitution, and also in the lack of vigorous strengthening bodily exercises.

A Normal Lateral Curvature of the Spine. — This curvature has its explanation, according to several authors, in the influence which the heart and aorta have upon the spinal column. It is, however, a hypothetical curvature, as to the existence of which there must be great doubt, as shown by extensive observations. If such a physiological curve really exists, it would of course give a certain disposition to a pathological curve.

Scrofula is given by some authors as a conducive cause of scoliosis. This, however, is contrary to my experience. After many years' treatment of scrofulous patients by medical gymnastics, it has not appeared to me that scoliosis is more common in individuals who have this disease than among others. This observation is borne out by the experience of H. Sätherberg and M. Eulenburg. The latter author says that scrofula does not seem in itself to give more of a tendency to scoliosis than to pes varus, genu valgum, torticollis, and strabismus.

Swelling of the Vertebral Cartilages and Pathological Relation of the Ligaments of the Spinal Column. — Delpech, with numerous other authors, takes the ground that swelling of the vertebral cartilages may give rise to scoliosis. On this, H. Sätherberg remarks that such a swelling might occur, but those who seek a cause in this for the appearance of scoliosis must also explain why the vertebral cartilages swell only upon one side and in a peculiar way, those in the dorsal region swelling upon the right side and in the lumbar region upon the left side, a condition existing in a great majority of cases of double curvature.

As opposed to the opinion of W. Adams

and Malgaine, who considered the cause of scoliosis to be in the spinal ligaments, the same remark may also be made.

Pleuritic Exudate. — This has, in some cases, been a direct cause of scoliosis, but only in six particular cases has pleuritic exudate been the exclusive cause. But this, like other similar special causes, as cramp and neuralgia (M. Eulenburg), can only be considered as an incidental coincidence.

Paralysis of the Muscles of Inspiration. — Stromeyer considers that the majority of cases of scoliosis arise from paralysis in certain of the muscles of inspiration. He sought to apply the theory of Charles Bell in regard to the double nerve supply for certain of the refractory muscles as the origin of scoliosis. The levator anguli scapulæ, sterno-cleido-mastoid, and rhomboideus receive branches both from the spinal nerves and from the spinal accessory. The function of the latter may be interrupted without interfering with the former. After the division of the spinal nerves going to the above-named muscles, according to Bell's experiments, the involuntary breathing would cease, but not the voluntary.

Stromeyer claims the same mode of action for the thoracic nerve upon the serratus magnus muscle, as well as the spinal accessory nerve upon the muscles already named. On account of paralysis of the thoracic nerve, the involuntary activity of the serratus magnus muscle ceases, while the voluntary activity remains. Because of this disturbance, there is a different development on the opposite side of the thorax, and as a result scoliosis sets in. The author claims that this most generally takes place upon the left side. This theory has won recognition from numerous scientists. Rokitansky speaks of it in his "Pathological Anatomy;" but H. Sätherberg says that the reception of Stromeyer's theory would unconditionally lead us to an extremely strange conclusion in reference to the nature of paralysis in general. The S-formed scoliosis rarely appears before the seventh year, and its occurrence is extremely rare among boys. If we accept Stromeyer's theory, then we must also take the position that paralysis could rarely affect the muscles of respiration before the seventh year, or those of more advanced years, and that boys are much less subject to it than girls. I see no ground, however, for taking such a position in regard to the nature of paralysis.

M. Eulenburg remarks that "it is singular that the paralysis of the serratus magnus muscle should occur so frequently upon the left side. The cause which this theory assigns for scoliosis can command no greater significance than that which should be given to any predisposing cause, as, for example, pleuritic exudate."

Inflammation of the Muscles. — If the muscles are seized upon one side by a painful affection (rheumatism), causing the patient, for relief of the pain, to seek to maintain the muscles in as active a condition as possible, then, in consequence of the activity of the antagonistic muscles, there will follow a curve of the spinal column, with the concavity toward the sound side. Scoliosis from this cause could rarely occur. Although I have had under my care a large number of cases of inflammation of the muscles of the back, there have been among them but two cases of scoliosis which have arisen from this cause.

Contraction of the Muscles. — Two forms of pathological contraction of the muscles have been given by different authors. Professor Blasius gives a prominent pathological contraction of the muscles of one side (still retaining, however, the ability to relax) as the primary cause for scoliosis through an abnormal activity of the nervous system.

The other form — a pathological contraction of a part of the muscles of one side — is given by Guerin. Neumann also gives contraction of the muscles as a cause for scoliosis. That a certain form of rheumatic inflammation may occasionally cause a permanent contraction cannot be denied. Torticollis frequently occurs as the result of such a cause; but to take the position that this is a general cause is opposed to both experience and theory. The definite form under which the majority of cases of scoliosis fall, witnesses clearly against the admission that a pathological retraction in certain muscles is a general cause for scoliosis, for no good reason can be given why this pathological process should so constantly arise in the same place.

Another striking argument against this opinion is, that if the theory were correct, subcutaneous operations should be followed by favorable results. Dieffenbach, who was specially noted as a defender of

subcutaneous myotomy and tenotomy, says that this operation is contraindicated in scoliosis. Malgaine, Büring, and M. Eulenburg say that subcutaneous operations in scoliosis are not followed by favorable results.

(To be continued.)

OVARIAN GRAFTING FOR PREVENTING DISTURBANCES FROM POST-OPERATIVE MENOPAUSE.

BY J. H. KELLOGG, M. D.

Dr. Chrobak, professor of obstetrics at Vienna, with Mainzer, Landau, Mond, and others, have succeeded in preventing the disturbances due to the menopause occurring after removal of the ovaries, by the administration of ovarian juice; but the good effects obtained ceased as soon as the remedy was no longer administered. Chrobak recommends that a portion of the ovaries should be left, when possible, or that the ovaries of other animals should be implanted.

Chrobak has frequently left portions of ovaries, but has not undertaken the experiment of implantation of the ovarian tissue of other animals in women, although experiments made by Dr. Knauer in animals have shown very good results, the implanted ovaries becoming provided with numerous blood-vessels, and apparently carrying on their function in a normal way, which goes to show that the sexual glands are useful in the body not simply with reference to reproduction, but as a means of maintaining a state of normal equilibrium in the various vital functions, and in some manner regulating tissue changes through their secretion.

In operating upon a patient July 22, 1896, for removal of diseased appendages, I made an ovarian graft as follows: I first prepared a place for the graft by separating the skin and subcutaneous tissues from the sheath of the rectus muscle extending to the left of the incision a couple of inches. As soon as the appendage was ligated, I cut off about one third of the ovary, making the division transversely, and leaving half an inch of the ovarian ligament attached to the excised portion. This I carefully placed at the bottom of the pocket made as above described, and then proceeded to close up the wound in the usual manner, taking care to keep the graft in position. No inconvenience has thus far arisen from the implantation of the ovarian tissue, but sufficient time has not yet elapsed to determine what will be the effect in diminishing the nervous disturbances which are sometimes so distressingly intense as the result of the changes set up by the removal of the appendages.

ONE MONTH'S MEDICAL WORK OF THE COLORADO SANITARIUM.

BY W. H. RILEY, M. D.,

Superintendent Colorado Sanitarium, Boulder, Colo.

The Colorado Sanitarium began its work as an institution for the treatment of all forms of chronic disorders, July 1, 1896. From July 1 to August 1, 1896, fifty-nine persons were received and treated in the institution. This does not include a large number of transients, who live outside and come to the institution for treatment, daily.

These fifty-nine persons are from the States of Colorado, Ohio, Michigan, New York, Missouri, Kansas, Pennsylvania, Minnesota, Wyoming, Iowa, Nebraska, Illinois, District of Columbia, Wisconsin, Nova Scotia, and Ontario, Canada.

Without giving a detailed diagnosis of each case, the disorders that have received medical treatment in the institution come under the following heads:—

1. Diseases of the lungs, nineteen cases. All these cases contracted the disease outside of the State of Colorado, and came to the sanitarium to be treated for pulmonary trouble, especially. The bacilli of tuberculosis were found in fourteen out of the nineteen cases. Besides the bacilli of tuberculosis, in many of the fourteen cases were found cocci of different forms, showing that there was a mixed infection. Elastic tissue, pus, and blood were found in several cases.

2. Diseases of the female genito-urinary organs, sixteen cases.

3. Naso-pharyngeal catarrh, seventeen cases.

4. Diseases of the digestive system, sixteen cases.

5. Catarrh of the middle ear, with deafness, two cases.

6. Nerve exhaustion, four cases.

7. Chronic malaria, with plasmodia of malaria found in the blood, two cases.

8. Organic disease of the heart, one case.

9. Right hemiplegia, with paraphasia, one case.

10. Hay fever, one case.

11. Abscess of the breast, one case.

12. Herpes zoster, one case.

13. Convulsive tic, on right side of face, one case.

14. Spastic paraplegia, one case.

During the month of July the following work has been carried on in the laboratory of hygiene connected with the Colorado Sanitarium: —

1. *Examination of the Urine.*— Chemical and microscopical examination of the urine has been made of sixty-five different specimens. A twenty-four hours' specimen is required of each person who enters the institution as a regular patient. Albumin was found in seven cases; pus was present in six cases; four cases showed granular casts; two of the four cases in which casts were found had tuberculosis of the lungs.

2. *Examination of the Sputum.*— There have been thirty-three specimens of sputum examined, from twenty-one cases. Fourteen of the cases examined showed the presence of the tubercle bacilli; and elastic tissue was found in eight of them.

All the lung patients are required to use private cuspidors, and no one is allowed to spit on the grounds or the floor. All the sputum of each case is collected in these individual cuspidors, which are gathered up at least once each day, the sputum being burned in the furnace. The strictest measures are carried out in the institution to prevent infection, and no one in the building or upon the sanitarium premises is in the slightest danger of contracting the disease from another patient.

The sputum of each case is examined at least once a week, for the purpose of determining if there is any change in the amount of expectoration.

3. *Examination of the Blood.*— Microscopical examination of the blood has been made in forty-seven cases, having reference to the percentage of hemoglobin, the size and shape of the red corpuscles, and also to the number of white blood cells.

The amount of hemoglobin was one hundred per cent. in five cases; between ninety-three and one hundred per cent. in eight cases; between eighty-five and ninety-eight per cent. in eight cases; between seventy-nine and eighty-seven per cent. in seven cases; between seventy-one and seventy-nine per cent. in eleven cases; between sixty-five and seventy-one per cent. in one case; and between fifty and sixty-five per cent. in two cases.

In twenty-seven cases the white blood corpuscles were normal in number, or 4,500,000 to 5,000,000 per cu. m.m.; in eleven cases, they were decreased in number; and in nine cases they were above the normal number.

Methods of Treatment. — The remedies used in the institution for the treatment of various diseases consist in the application of hydropathy in its different forms, based upon the results obtained by scientific investigation of the action on the body of different forms of baths. All forms of electricity are used, and such a current is selected as seems best adapted to the case in hand. "Rest-cure," massage, manual Swedish movements, graduated exercises, including mountain climbing, are among the therapeutic remedies used.

Regulation of the diet and careful attention to the nutrition of the patient form important adjuncts in the treatment of every case that enters the institution.

Special rooms are arranged for the continual inhalation of medicated air in cases of tubercular and other forms of lung trouble when indicated. The intelligent use of the above remedies, in connection with the climatic advantages of an elevation of about five thousand feet, provides the very best opportunity for the treatment of that large and apparently increasing class of chronic invalids suffering from tuberculosis of the lungs and other pulmonary troubles.

With every sunset for three hundred and sixty-five days in the year, and that year after year, no less than four hundred fresh graves are added to the large army of the sleeping dead as the result of the ravages of that dread disease, pulmonary consumption. The Colorado Sanitarium reaches out a helping hand to this unfortunate class of invalids, and has already brought relief to a large number whose lives were endangered by the insidious development of this malady.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

HOT AND COLD APPLICATIONS IN THE TREATMENT OF THE EYE.

IN an article on this subject in the August number of the *University Medical Magazine*, Dr. William C. Posey, of Philadelphia, remarks that it is evident that heat and cold exert a profound influence upon the temperature of the human eye, and that the intensity of their effect depends largely upon the length of time they are applied. If, therefore, the treatment of ocular diseases was simply a question of influencing the temperature, the indications for the employment of these agents would be quite simple; but in addition to the action which they have upon heat control, that which they exert upon the circulation of the eye, independent of its influence over the regulation of the amount of heat in a part, is of no less significance from a clinical standpoint.

In inflammatory conditions, cold limits the exudation and checks the secretion by constricting the capillaries; while heat aids in the healthful repair of tissues by promoting absorption of the exudation, and by carrying the proper nourishment to the part. Again, in the early stages of inflammation, cold relieves pain both by preventing the flow of blood to the part by contracting the blood-vessels, and by limiting the amount of exudation. In the latter stages, heat relieves pain by causing absorption of the exudation, and lessening the tension of the inflamed area. Moreover, heat greatly augments the diffusibility of liquids into the eye, for Bellarminoff and Dolganoff have shown that the rapidity and the amount in which drugs are absorbed after the application of the hot compress are due to a change which is wrought in the corneal epithelium.

Finally, both agents have a germicidal action. It has been found that a 1–10,000 hot solution of bichlorid of mercury is more efficacious in preventing pus-formation than a cold one of 1–2000. Water itself at a temperature of from 230 to 284° F. kills many bacteria, while cold, even of the degree at which it may be applied to the eye, will prevent the development of germs.

Heat and cold may be applied in either a moist or a dry form. A greater action is usually derived from the moist compress, whether it is hot or cold, for Jaennec, says the author, has proved that therapeutically moist heat is not only more penetrating than dry heat, but gives a greater variation in the degree of heat. Giesse has also shown that the cold compress will lower the temperature much more rapidly than bladders filled with ice; moist applications also possess the greater advantage of washing away all secretions from the conjunctival sac.

In regard to the toilet of the eye, lukewarm applications will usually be found to give the greatest comfort. A little boric acid or sodium chlorid added to the water will make the application even more grateful. In regard to the practise of opening the eyes in a basin of water after the head has been immersed in it, Dr. Posey says that we are not fishes; our eyes are not adapted for such a procedure, and we should rest satisfied with the glass dropper or the eye-cup.

In hyperemia of the conjunctiva, induced by ametropia or by the presence of a foreign body, cold is a simple but effective means of restoring the membrane to its healthy condition. In these cases, the douche or the compress may be applied over the closed lids with the greatest advantage for fifteen minutes at a time. The water employed should not be too cold, or excessive reaction may follow its use.

In the severer forms of conjunctivitis, when there is a purulent inflammation or an exudate, ice is the sovereign remedy; and there is but one way to apply it — by the continued use of the ice compress. Disastrous results need not be feared, says Dr. Posey, from its prolonged application, for of all the remedies used to combat this type of disease in the early stages, this is undoubtedly the best. At the outset of the disease the board-like swelling of the lids is doubtless one of the chief causes in elevating the temperature; and, as the swelling and induration prevent the cold from gaining access to the eye, it is necessary that the treatment should be energetic and prolonged. The application of compresses, therefore, should be maintained night and day in such cases, and should only be desisted from when a

corneal ulcer threatens or the secretion becomes excessive. When either of these two contingencies arises, the ice compress should be replaced at once by the hot application, and this should be persisted in for fifteen minutes every two or three hours. The hot water will relieve the stagnant condition of the corneal circulation that has been induced by the intense chemosis of the bulbar conjunctiva, and thus favor the repair of the cornea.

In treating disease of the cornea, hot compresses are always indicated, never cold. The cornea is normally a non-vascular structure, and is dependent for its nourishment upon the tissues surrounding it; and if these are diseased, a stasis in the nutritive supply of the membrane occurs, and ulceration ensues. The chief indication, therefore, in treating diseases of the cornea is to prevent this stasis. This, he says, is admirably accomplished by means of moist heat, provided it is properly applied. One of the most frequent forms of corneal ulceration is phlyctenular keratitis. This disease occurs usually in children of a scrofulous diathesis, and there is no sadder sight nor more striking example of the injury wrought by the ignorant application of remedies by the laity than is seen in this disorder. Dr. Posey states that it is frequent in the ophthalmic clinics to hear the mothers of such children recite with pride a list of all kinds of harmful and disgusting substances with which they have poulticed the eye,—tea leaves, rotten apples, raw oysters, bread and milk, and potatoes, are the favorite articles,—and the persistency and ignorance with which they are employed are most distressing to the intelligent practitioner. Dr. Posey says emphatically that poultices should never be employed in diseases of the globe itself, although they are at times of service in inflammations of the *annexa*.

Instead of the use of the poultice, moist heat is best applied in diseases of the cornea by the ordinary compress, which should be kept applied for ten or fifteen minutes at a time four or five times daily.

Hot compresses will be found to be an excellent stimulant to sluggish ulcers, and will also hasten the absorption of nebulæ. A few drops of scalding water, applied directly to a myotic ulcer, will exert a powerful antiseptic action upon it. In interstitial inflammation of the cornea also, when the whole uveal tract is inflamed, and the ciliary body especially is hyperemic, much relief will be afforded by the prolonged and unvarying use of hot fomentations, for from three to eight hours daily at periods of every two hours. Indeed, where posterior synechia has not yielded to atropine, and where there is a rise in the intraocular tension, the mydriatic will have to be withdrawn, and only hot applications and the administration of an alterative internally to lessen the inflammatory condition can be used.

In the early stages of granular conjunctivitis, hot water is frequently badly borne; as soon as the vascular condition of the cornea manifests itself, however, the use of hot compresses should be inaugurated, for the inflammatory reaction which they occasion is frequently sufficient to cause the disappearance of the pannus.

One of the most distressing symptoms of phlyctenular disease, continues Dr. Posey, is the photophobia, with spasm of the orbicularis, which it occasions; great difficulty is often encountered in applying the proper remedies to the eyes until these have been made to subside. In urgent cases the eyes may sometimes be opened by immersing the entire head of the child in a bucket of cold water, the sense of suffocation and shock causing it to open its lids in a reflex way as it gasps for breath. An equally effective and less heroic measure consists in permitting a few drops of ice water to trickle between the lids, which are then gently coaxed apart by the surgeon's fingers.

It is a matter of experience that dry heat is more efficacious than moist heat in soothing the pain of neuralgia. It will also be found that in cases of iritis, when there is little or no secretion except the tears of reflex irritation, the dry compress is the most efficacious, while in iritis secondary to inflammations of the cornea the moist compress gives the best results.

In addition to its action upon the blood-vessels of the iris and ciliary body, the hot compress is invaluable on account of its increasing the absorption of drugs which are used for the purpose of dilating the pupil. It will frequently be found that mydriatics exert but little influence over the pupil in cases of iritis, even when the synechiæ are not very tenacious. Leeching and cocaine will partly overcome this, but there is nothing so effi-

cacious as bathing the eye with water as hot as can be borne about ten minutes before the instillation of the mydriatic.

After penetrating wounds of the eye, particularly when the iris and the lens have been injured, and if there is the complication of plastic iris and traumatic cataract, in addition to the other treatment, the author states that the continuous use of the ice compress will be found to be a potent agent in combating inflammatory reaction, and in preventing the invasion of noxious germs by reducing the temperature of the parts. In suppurative panophthalmitis, he says, hot applications are grateful from the very onset, and may be kept up almost continuously. The pain arising from muscular asthenopia is also often allayed and the symptoms at times are made to disappear by the use of hot compresses, for the heat actually increases the contractile power of the weak muscles. But if there is any tendency to disease of the deeper structures of the eye, such as the retina or the optic disk, it is well to avoid the use of hot applications, as they may cause further mischief by increasing congestion in these delicate membranes.—*N. Y. Medical Journal.*

Pleural Effusion.— Baccelli (*Il. Policlinico*, June 14, 1896) calls attention to a sign which is an aid in the diagnosis of fluids in the pleura. The patient being made to utter the word "trentatre" (Italian 33) in a whisper, if the fluid is very thin, every letter of the word will be heard; but in proportion as the fluid is thicker, the letters are gradually lost, up to final disappearance of all conduction. The first letter to fail is *r*, then *t*, then *n*, and finally the vowel sounds. In order to hear this "Baccelli's phenomenon," direct auscultation should be used in the antero-lateral and inferior regions of the thorax, and without the stethoscope.

A Reagent for Alcohol.— Even minimum traces of alcohol in aqueous solutions may be detected by molybdic acid (*Chemical News*). The sensitiveness of this test extends, for ethyl alcohol, to 0.02 per cent.; and for methyl alcohol, to 0.2 per cent. Molybdic acid is dissolved in concentrated sulphuric acid, and the solution thus obtained is stratified in a test-glass at about sixty degrees below the liquid under examination. At the surface of contact of the two liquids there appears a distinct blue ring, the intensity of the color varying with the amount of alcohol present. On shaking, the blue zone disappears, but reappears on the addition of more molybdic acid. The reaction is not specific for alcohol.

Tobacco, Tea, and Champagne in England.— The great increase in the consumption of tobacco (*Therapeutic Gazette*), especially among growing lads, can not fail to have its due effect on the development of both mind and body. The net revenue yielded last year by the tax on tobacco amounted to $52,500,000, this being more than $1,500,000 in excess of the sum afforded from the same source during the preceding year. This excess is attributed by the chancellor of the exchequer mainly to the increase in the consumption of cigarettes. Another point revealed by the budget is the increase in the consumption of tea, ten million more pounds having been consumed during the past than in the previous year. That we are not becoming a more temperate nation is shown by the fact that in 1895 no less than 1,200,000 extra bottles of champagne were consumed.

The Fly as a Germ Carrier.— In 1866, Hoffman demonstrated the presence of tubercle bacilli in the bodies of flies captured in a room occupied by a consumptive. The droppings of the flies were full of bacilli, which were shown by experiment to be fully virulent.

Six years later Mr. A. Coppen Jones. of Switzerland, proved by means of chromogenic bacteria that infection can be, and actually is, carried, not only in the bodies of flies, but also by their feet. In one experiment, cultures of the bacilli prodigiosus were mixed with tuberculous sputum. Flies which had been in contact with this mixture were permitted to walk across the surface of sterilized potatoes. In forty-eight hours numerous colonies of the bacillus prodigiosus were visible.

From these results we may reasonably conclude that flies are a constant source of infection.

Creosote in Gonorrhea.— Asmus (*Meditz. Obozr.*, 1896, No. 10) reports fifty-eight male cases of acute gonorrhea successfully treated with injections of a 2-to-10 per thousand emulsion of creosote. The discharge quickly decreased, became mucoid, and then ceased altogether. The patients recovered more rapidly than under the ordinary methods of treatment; complications developed but rarely, and no relapses occurred. In addition, creosote seemed to exercise an anesthetic action on the urethral mucous membrane.

Massage in Chronic Heart-Disease.— J. Zabludowski (*Berlin Kliniche Wochenschrift*, 1896, xxxiii, pp. 435–437) advises the employment of massage in cases of chronic heart-disease where rest is indicated. When properly applied, the pulse-rate is diminished, the quality improves, the sleeplessness is relieved, and a decided change for the better is noticed in a few days.

It is essential that the patient lie in a convenient position, so that the part to be acted upon shall be entirely lax. The movements must be energetic, but not rough, and last ten to fifteen minutes; the time of application should be one to two hours after the first meal. All kinds of massage may be used with the exception of tapotement. Massage has also been found serviceable in the treatment of neurosis, sclerosis of the coronary arteries, hypertrophic conditions resulting from high living, and heart weakness following la grippe. The time of treatment should extend over a period of four to six weeks of daily treatment.

The Treatment of Epistaxis.— Gillette says (*British Medical Journal*) that peroxid of hydrogen injected into the nasal cavity will stop hemorrhage from the nose. Use the remedy in full strength, and the result will be immediate. When operating in the nasal cavity, if bleeding hinders the work, inject peroxid of hydrogen, and ask the patient to blow the nose, and the field will be left clear again.

Heredity and Crime.— The following, taken from the *Medical Press*, compiled by Professor Pellmann, of the University of Bonn, relates the career of a notorious drunkard, who was born in 1740 and died in 1800. Her descendants numbered 834, of whom 709 have been traced from their youth. Of these, seven were convicted of murder, seventy-six of other crimes, 142 were professional beggars, sixty-four lived on charity; and 181 women of the family led disreputable lives. The family cost the German government for maintenance and costs in the courts, almshouses, and prisons, no less a sum than $1,250,000; in other words, just a fraction under $1500 each. It would probably be difficult to find a more remarkable example than this of the evil effects of the transmission of hereditary defects.

Thyroid Extract in Gynecology.— Dr. Hortoghe, of Antwerp, who claims to have obtained excellent results from the use of thyroid products in gynecology, summarizes his observations as follows: —

1. Myxedematous hemorrhages are directly amenable to this treatment.

2. The same is true of hemorrhages due to endometritis and oophoritis, even of old standing.

3. Menorrhagia of whatever origin, is favorably influenced by thyroidin. Cancerous hemorrhages, though it may appear to be incredible, cease promptly under three or four days' thyroid treatment. Other symptoms, such as pain, swelling, and congestion, are also markedly relieved by this treatment.

4. In women who are prone to miscarriage on account of the fecundated ovule being carried away by a too copious menstrual flow, the administration of thyroid juice diminishes the molimen and uterine congestion. In one case described in detail by the author, a woman who had been sterile for seven years was enabled by the inhibitory action of thyroidin to conceive and give birth to a child at term.

5. Thyroidin is useful in cases of uterine myoma, prolapse of the uterus, retroflexion with hemorrhage and, in general, in all cases in which it is of importance to reduce the size, congestion, and sensitiveness of the uterus.

6. Lastly, on account of the special action of the thyroidin on the mammary glands, this substance should be given to wet-nurses with a defective secretion of milk.

Gastric Crises in Diabetes Mellitus.— Grube (*Munch. Med. Woch.*) gives the name of "gastric crises" to the attacks which occur not infrequently in diabetes, coming on suddenly with vomiting, colicky pains, dry and coated tongue, cramp in the legs, and slight fever. Diarrhea sometimes occurs. The attacks last from several hours to several days. Grube thinks the attacks represent a form of diabetic intoxication, in which the vagi are irritated by toxins circulating in the blood. Under proper treatment, recovery is the rule. The most important thing is to cause copious stools by means of enemata. Hot applications to the abdomen are also useful. The vomitus consists generally of the undigested meal previously taken.

Heat Regulation.— The following interesting facts have been developed by a series of experiments by Dr. Pembrey (*Journal of Physiology*, XVIII, 363): —

"In newly born animals, the power of heat regulation varies according to the development of the animal at birth. Young animals such as mice, rats, and pigeons, which are born blind, naked, and helpless, respond to changes of external temperature in a way somewhat similar to that seen in cold-blooded animals; the variations in the respiratory exchange and the temperature of the animals are in the same direction as the changes of external temperature. These young animals cannot regulate their temperature. On the other hand, such young animals as guinea-pigs and chickens, which are born in a condition of high development and with protective coverings, are able even at birth to maintain a constant temperature, provided that the changes in external temperature are not excessive.

"It is important to consider here the part played by the loss of heat; in small naked animals, like young mice, the cutaneous surface in relation to the mass of the body is very large, and thus more rapid cooling will take place. But that this is only a secondary factor to the development of the power of regulation is shown by the fact that when the fur is quite long, an exposure to cold does not increase and maintain the increase in the output of carbonic acid so well as in the adult, and after a time the temperature of the young animal falls. Moreover, a pigeon fifteen days old can maintain its temperature fairly well, although three quarters of its body is naked.

"The activity of the animal has also to be considered. In adult warm-blooded animals and in newly born animals like the guinea-pig and chick, a low temperature increases the activity of the animal. . . . In warm surroundings, on the other hand, the animal is quiet and often goes to sleep; if the temperature is very high, it lies extended to expose as large a surface as possible, and sweats. In young animals, which only imperfectly regulate their temperature, muscular activity is often most marked and maintained at the higher temperatures. The first effect of a fall is often, it is true, to make the animal active, but its movements soon become feeble, and as regards their purpose, are of a similar nature to shivering.

"The development of the power of heat-regulation proceeds simultaneously with the development of the nervous and muscular systems. At the same time the relation of the cutaneous surface to the mass of the young animal and the absence or presence of protective coverings are factors, but only of secondary import."

Tuberculous Cows' Milk.— After the most careful experiments, Drs. Ernst and Peters arrive at the following conclusions concerning the infectiousness of milk: —

"First and emphatically, that the milk from cows affected with tuberculosis in any part of the body may contain the virus of the disease.

"That the virus is present, whether there is disease of the udder or not.

"That there is no ground for the assertion that there must be a lesion of the udder before the milk can contain the infection of tuberculosis.

"That, on the contrary, the bacilli of tuberculosis are present, but with no discoverable udder lesions."—*Journal of the American Medical Association.*

Therapeutic Effects of the "X" Ray. — Experiments have shown that "X" rays have no destructive effects upon microbes. But Nicola Tesla says their effect, when directed upon the human brain, is soothing and gently stimulating. This influence may be wholly psychic.

Toxic Germs of Alcoholic Drinks. — Daremberg (*Arch. Med. Experimentale*, November, 1895) has recently completed a series of experiments for the purpose of determining the toxicity of various alcoholic drinks by the injection of rabbits. Contrary to the popular notion, it is found that wine drinks are more poisonous than drinks made from purified alcohol, and that wines are more poisonous than solutions of pure alcohol of the same strength.

Oysters and Typhoid Fever. — M. Chantemesse (*La Presse Medicale*) recently communicated to the French Academy of Medicine the results of an investigation which he believes establishes, beyond room for question, the fact that typhoid fever may be communicated by oysters. The case which gave rise to the investigation was as follows: —

In a small community where typhoid fever had not appeared for a period of one year, a family was suddenly attacked with various disturbances, after eating oysters from Cette. Some of the members of this family suffered only from gastralgia, others from more severe gastric disturbance; while others had a regular attack of typhoid fever.

A bacteriological examination of the oysters, made by M. Chantemesse, revealed the presence of both the coli bacillus and the typhoid bacillus.

After having been allowed to remain some days in a mixture of sea-water and fresh water, the oyster still contained a quantity of the same virulent bacilli, and Chantemesse concludes from this observation that the oysters furnished for consumption in the markets of Paris are dangerous. The author states that "the contamination of oysters occurs in oyster beds at the mouths of rivers; the more heavily the rivers are charged with organic matter, the fatter the oysters become, and the more dangerous."

American physicians have called attention to analogous facts, several instances of a like character having occurred in this country.

The work of M. Chantemesse has been placed in the hands of a special commission composed of MM. Gautier, Cornil, and Laboulbène, eminent scientific men, who will give the subject the serious attention which it deserves.

Thyroid Extract in Goiter. — A German physician has recently reported excellent success in the treatment of hypertrophic goiter by thyroid extract. The dose for an adult is two tablets per day; for a child, one tablet. The treatment proved most advantageous in young persons.

The Oxidation Ferment. — M. Carnot recently reported to the Biological Society of Paris (*Medical Week*, June 5, 1896) the discovery, in the saliva, of a ferment which gives rise to oxidation. This ferment was found in the secretions of all the salivary glands, in the buccal mucus, in the nasal mucus, in the tears, and in the product of some other glands, but was not found in the urine, the bile, or the intestinal juices.

Cinnamon for Dysentery. — A surgeon in the British army in India writes to the London *Lancet* that he has for several years employed with success in the treatment of dysentery a very simple remedy, consisting of one dram of cinnamon bark reduced to a fine powder and made into a ball with a few drops of water. This may be taken every morning and evening. He learned of the remedy from a Persian medical work, it being very popular in Persia. Its virtues may be due to the antiseptic or germicidal properties of oil of cinnamon.

Infectious Character of the Feces of Tuberculous Cattle. — Scientific research is constantly bringing to light new methods by which tubercle bacilli are communicated to human beings. The *Bulletin Medicale* recently published a report of a series of experiments conducted for the purpose of determining whether these bacilli are to be found alive in the excreta of cattle. A young bullock was fed a meal consisting of bread and a portion of a tuberculous lung. During the three days following, portions of fecal matter were collected and investigated, both by the injection of animals and microscopical examination. Bacilli were constantly found in the feces, and out of fifteen rabbits inoculated, twelve became tuberculous, showing that the fecal matters of tuberculous cattle are as infectious in character as the sputum of persons suffering from this disease.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

Rapid Isolation of Bacillus Coli Communis.— Abba (*Centr. f. Bakt., Parasitenk, u. Infectionskrankh.*, Bd. xix, 1896, p. 13) gives a new method for the "rapid and certain isolation of bacillus coli communis from water." He prepares the following culture medium: Lactose, 20 g.; dry peptone, 100 g.; sodium chlorid, 50 g.; and water, 1 liter. This may be solidified by the addition of gelatin. Into a liter of suspected water is placed 100 c. cm. of the previously sterilized culture medium; to this is added 0.5 c. cm. of a one per cent. alcoholic solution of phenol-phthalim, and afterward a cold saturated solution of sodium carbonate (usually 2 to 3 c. cm. suffice) until the water becomes of a permanently pink color. This water is placed in five or six Erlenmeyer's flasks, and incubated at 37° C. At the same time an agar plate is poured, and is placed in the incubator along with the Erlenmeyer's flasks. If bacillus coli were present in the water, after twelve, sixteen, or twenty-four hours one or several or all of the flasks will show complete decolorization of the contents. The agar plate is inoculated from the surface of one of the colorless fluids; this is again incubated, and in from eight to twelve hours or less a number of colonies will be visible on the surface of the agar. These colonies are examined under the microscope, and cultures made from the ones which most resemble those of the bacillus coli. Under these conditions the bacillus coli rapidly gains the upper hand over most of the other micro-organisms present in the water. The colonies on the agar plates are usually composed of bacillus coli alone, and the first examination leads to their detection, if present.

Excretion of Micro-organisms.— Biedl and R. Kraus (*Centralbl. f. inn. Med.*, July 18, 1896) have previously shown that micro-organisms present in the blood are excreted by normal kidneys, the urine being free from albumin or blood. These investigators now record their experiments on the excretion of micro-organisms by the glandular organs. By injecting cultures of staphylococcus into the blood, they have investigated the function of the liver and submaxillary gland in this respect. They found negative results in two of the first four experiments where the gall-bladder was opened immediately after death, the usual precautions being used. In another series of experiments the bile was inoculated directly into nutrient media, a canula having been placed in the bile passages. In case of the submaxillary gland a canula was placed in the duct, and the same method followed. In all these cases the staphylococcus was obtained from the bile, but the results were negative in all cases where the submaxillary secretion was investigated. The micro-organisms were shown to be continuously excreted in the bile during one and a half to two hours, while the experiment lasted. From these experiments these investigators conclude that as in the case of the kidneys the excretion of micro-organisms is a normal function of the liver.

New Method of Diagnosing Typhoid Fever with Serum from Patient.— Recent investigations by Pfeiffer, Koll, and Gruber have shown (*Bulletin Medicale*, June 28) that the serum of persons convalescing from typhoid fever, the same as the serum of animals immunized against typhoid infection, will produce a distinct and specific reaction when added to a culture of Eberth's bacillus *in vitro*. They found the same phenomena with the cholera spirillum and Escherisch's bacillus. The process is so clearly defined that it promptly differentiates the disease, while it is so simple that it requires nothing but a tube culture of Eberth's bacillus (which keeps for weeks) and a drop of blood to complete it. If a few drops of immunized serum be added to a culture of the coli bacillus, a noticeable cloudiness is produced, with decided motility of the microbes. The effect is entirely different if they are added to a tube culture of Eberth's bacillus. There is no cloudiness, but the reverse; the microbes cluster in masses, forming agglomerations and a precipitate at the bottom of the tube, with limpidity instead of cloudiness. This agglutination is the point in differentiating, and the higher the serum is immunized, the more

rapid the effect, sometimes occurring as rapidly as a chemic process.

Widal announces that he has been testing the serum from patients in various stages of the disease, and has found the reaction unmistakable in each. He draws the blood from the vein in the bend of the elbow, with a syringe, after antiseptic precautions, or from the hand of the patient, hanging over the edge of the bed, after slightly massaging the finger from the root to the point, when a prick with the lancet will draw enough blood (½ to 2 c.c.), which should be caught in a thimble or test-tube first passed through a flame. After corking, and waiting a few minutes for the serum to separate, add one drop of the serum to ten drops bouillon culture of Eberth's bacillus, and in a very short time the agglomeration commences, if it is a case of typhoid. Between the characteristic agglutinations a few scattered and motile microbes are still to be seen, growing less in number until, in a few hours, they have all been absorbed into the clustered masses. The drop of blood can be drawn directly into the culture, but no time is gained, as the serum has still to separate. Widal also made the test with serum from normal persons and from numerous patients suffering from different diseases, as well as from persons who had recovered from typhoid fever from one to fourteen years previously. In each of these cases there was none of the specific typhoid reaction, the agglomeration, but the Eberth's bacillus kept on the even tenor of its way, isolated and motile.

Bacteriology.— Professor Savtchenke (*La Press Medicale*) has recently described a new microbe which produces a disease similar to that produced by the fungus of ordinary actinomycosis.

Streptococcus of Scarlet Fever.— M. Ad. d' Espine (*New Eng. Med. Month.*, July, 1896) has isolated from the blood and tonsillar exudation of scarlet fever cases a streptococcus which rapidly coagulates milk, with the formation of whey and curd. In this respect it differs from the common streptococci, which, though they curdle milk, form a compact clot without producing whey. The scarlatina streptococcus is much smaller than the ordinary cocci, and differs in shape, being round, while the ordinary coccus is lenticular.

Are Microbes Necessary to Human Life? — A correspondent of the *Polyclinic* (Philadelphia) writes as follows in opposition to the popular theory that microbes are necessary to physiologic digestion: —

"As far as the animal body is concerned, the interesting experiments of Nuttall and Thierfelder indicate its independence of bacterial life, for they have shown that in the absence of all microorganisms an animal may live and thrive.

"Their experiments were as follows: A young guinea-pig was secured by Cæsarian section, under strict aseptic and antiseptic precautions, and immediately transferred to an apparatus consisting of a bell-jar placed over a small vessel containing water covered with a layer of oil. Over this vessel was laid a piece of wire netting, upon which the animal could move about. In the sides of the bell-jar were two apertures — in one a rubber glove, in the other a suction tube communicating with a bottle of sterilized cow's milk. The glove was connected with a rubber bag containing wads of cotton, which by manipulation of the glove could be placed on the wire screen, and after use could be dropped into the water beneath. The coating of oil prevented the evaporation of the water. From time to time the apparatus was ventilated with sterilized air.

"For a time the animal lay on its side, but soon rose on its legs, and as it became dry, grew active and lively. It received milk for the first time twelve hours after birth; thereafter, every hour, day and night. After eight days it was removed from the apparatus, killed, and opened under antiseptic precautions. A microscopic examination of the intestinal contents, in stained and unstained preparations, revealed a total absence of bacteria. Tubes inoculated with the contents and kept under both aërobic and anaërobic conditions remained perfectly sterile; not a single colony developed.

"From these results the experimenters conclude that the presence of bacteria in the intestinal canal is not necessary for guinea-pigs, nor for other animals or for man, at least not as long as the food is purely animal."

MODERN MEDICINE
AND
BACTERIOLOGICAL REVIEW.

PUBLISHED MONTHLY BY THE
MODERN MEDICINE PUBLISHING CO.

SUBSCRIPTION PRICE:
$1.00 per Annum. Single Copy, 10 Cents.

BATTLE CREEK, MICH., SEPTEMBER, 1896.

COW'S MILK A CAUSE OF DISEASE.

IT is a curious fact that the use of sweet cow's milk is chiefly confined to English-speaking nations, and many travelers have made the observation that tuberculosis, that great plague of civilization, which is responsible for from one seventh to one fourth of all the deaths which occur in England, America, Canada, and other English-speaking countries, is comparatively rare among nations who do not use cow's milk. The cow, of all domestic animals, is most subject to tuberculosis, and by its association with man there is abundant opportunity for the communication of the disease to the cow from human beings affected by it. The contagious character of consumption is now fully established, together with the fact that the germs which produce it are often found in cow's milk, and even in butter and cheese, existing in the latter for weeks without losing their activity.

The people of semi-civilized and uncivilized countries, and a few among civilized nations seem to have an idea of the deleterious qualities of cow's milk in its natural state; accordingly, we find that in many countries the milk of goats, sheep, or mares is substituted for that of cows, and with advantage, for the reason that these animals are only slightly subject to tuberculosis, and produce a milk which more closely resembles human milk than does cow's milk. The prevailing custom in the use of milk, however, in nearly all except English-speaking countries, is to avoid taking it in its natural, or sweet state. The German housewife never thinks of placing milk upon the table until it has been naturally fermented, and converted into a soft curd. Taken in this form, milk does not form hard curds in the stomach. The same is true of most of the countries of continental Europe. The same custom prevails in Scandinavian countries, also in Italy and Spain, Turkey, Hungary, and in all Asiatic countries. The Kaffirs of South Africa sour the milk before using it, placing it overnight in a gourd kept for the purpose, and which is never washed. The same custom prevails among the natives of the Congo and other portions of Africa where cow's milk is used. The natives of Iceland during their short summer milk their flocks of sheep, and pour the milk into a large hogshead in the back yard, where it quickly curdles, and from which it is used as needed throughout the year.

Milk a Natural Food for Infants, but not for Adults.— That milk is the natural food for the young of all warm-blooded animals is a physiological fact which no one will undertake to dispute. It is the first nourishment of the young animal, and continues to be the only food adapted to its wants for the first few months of its existence. It must be remembered, however, that each species of animals is provided with digestive organs peculiar to itself, and that the milk of each species is exactly adapted to the digestive organs which are to receive it, and to no other. Every nurse knows the injurious effects of cow's milk when given to an infant as a substitute for mother's milk without some modification, as by the addition of ordinary water, barley water, or some other diluent. Cow's milk differs very materially from mother's milk, containing less sugar, more fat, and four times as much casein as mother's milk. The casein in cow's milk also differs from that in moth-

er's milk, in that it forms large, firm, tough curds, whereas those formed in mother's milk are small, soft, and friable, crumbling easily into small particles under the action of the stomach.

It will thus be seen that the popular notion that since milk is the natural food of infants, cow's milk must be the most wholesome and easily digested of all foods for adults, is without proper foundation. When pure cow's milk is fed to infants, the child not infrequently vomits fragments of decomposing curds, which, after having remained many hours in the stomach, are still hard, tough, and leathery. Every nurse is also familiar with the fact that the bowel discharges of children fed upon cow's milk often contain large quantities of tough, undigested curds.

In the stomach of the adult even larger and firmer curds are formed than in the stomach of the child, for the reason that milk is taken by adults as a beverage, and is swallowed rapidly, causing the milk to curdle in large masses. The greater acidity of the gastric juice in adults also has a tendency to harden the casein into firm, resisting masses, which are broken down by the gastric juice with very great difficulty.

Another fact of importance is that the stomach in infants is so formed as to allow its contents to pass readily out through the pylorus; thus normal food does not remain in the stomach of the young child more than one or two hours, at the end of which time it is passed on and is brought in contact with the active digestive fluids of the intestines, where the complete digestion of milk takes place, the work of the stomach being simply to prepare it for the digestive action of the intestines.

In the adult the stomach is somewhat pouched in the left portion, for the purpose of retaining the food for a longer time. In many adults, and in a large proportion of dyspeptics, there is also more or less dilatation of the stomach; and the organ losing its ability to promptly empty itself at the end of the two or three hours of preliminary digestion, the food not infrequently is retained from five to seven hours, and sometimes several days in a dilated stomach. The left, or cardiac, portion of the stomach, is in some cases of dilatation, so enlarged as to form a pocket, in which undigested food is sometimes retained not only for days, but for weeks. Several such cases have come under the writer's observation.

The casein of milk is a nitrogenous substance, closely allied to flesh, and readily undergoes decomposition, the same as meat, eggs, and other animal substances. Milk, unless sterilized, always contains putrefactive germs, which readily set up decomposition of the casein in the stomach when the milk is retained for more than two or three hours, or when the gastric juice is not sufficiently strong thoroughly to destroy these germs. Even sterilized milk receives, while passing through the mouth, a sufficient number of germs capable of producing putrefaction to cause the same results under similar conditions, although, of course, the smaller the number of germs, the less likely the occurrence of these undesirable changes.

Milk the Cause of Biliousness.—In these facts we find a ready explanation of the influence of milk in producing the condition commonly termed "biliousness." Indeed, this is a matter of so common observation that, according to the writer's experience, the majority of persons suffering from attacks of bilious headache, sick-headache, or from chronic biliousness, on being questioned respecting the matter, remark that they have found it necessary to discard the use of milk as one of the articles most active in bringing on fresh attacks or aggravating the condition already existing. The observation that milk produces biliousness has given rise to the popular idea that it is bad for

the liver. The fact is that milk has no special influence upon the liver directly, but in the manner explained is liable to give rise to a state of putrefaction in the stomach, which of course disturbs the liver secondarily.

The writer has become thoroughly convinced that there are few persons who do not suffer sooner or later from the long-continued use of cow's milk.

Milk the Cause of Nervous Headache, or Migraine.— That the free use of milk as an article of food is one of the most prolific causes of migraine (nervous or sick-headache) the writer has had many opportunities to demonstrate in the treatment of patients suffering from this disorder. The simple prohibition of milk has cured many sufferers from this most distressing ailment. Examination of the stomach in these cases generally shows that it is dilated or prolapsed to such a degree as to cause retention of the food beyond the ordinary period.

That milk leads to decomposition in the stomach and the production of poisons by the absorption of which sick-headache and other distressing symptoms are produced, is doubtless due to the fact that it contains, as ordinarily received by the consumer, such multitudes of microbes. Professor Conn found that the milk obtained at Middletown, Conn., contained, within two or three hours after being drawn, from 330,000 to 9,000,000 microbes per ounce. The milk supply of Boston was found to be infected to a much greater degree, as many as 135,000,000 germs being found per ounce in some specimens. The milk of Madison, Wis., during the months of May and June, was found to contain 60,000,000 microbes per ounce.

The milk supply of European cities has been found infected to a much higher degree, the number of microbes being rarely less than 150,000,000 germs per ounce, and often reaching as high as 600,000,000, and sometimes to the enormous number of 5,400,000,000, in a single ounce.

The number of different kinds of microbes found varies from a half dozen or more to as many as fifty in a single locality. One German investigator found sixty-nine different kinds of microbes in a series of cheeses. These germs give rise to the so-called "ripening" of cheese, as it has been found that cheese cannot be made from boiled or sterilized milk.

Vegetable Substitutes for Milk.— Some years ago Sir B. W. Richardson, the eminent London physician, prophesied that the time would come when milk, as well as all other forms of animal food, would be derived directly from the vegetable kingdom. Many savage tribes obtain supplies of milk from vegetable sources.

The milk of the cocoanut furnishes a satisfactory substitute for cow's milk to the teeming millions of many tropical countries; while the cow-tree of South America provides a vegetable milk so rich in fatty matter that it might be more properly termed vegetable cream.

All nuts contain fats in a state of emulsion, and also a large percentage of proteid matters. By crushing and mixing with water, a solution closely resembling milk may be made from most kinds of nuts. The amount of fat and of proteid substances contained in such a solution does not differ very greatly from the proportions in which they are found in milk. The chief deficiency is in sugar. By the addition of a proper amount of sugar, preferably levulose or maltose, a very perfect substitute for milk may be produced. Such a preparation may be made from almonds in such a manner that it will contain all the elements of nutrition, and in proportions better adapted to the wants of human beings than does cow's milk. The fat which it contains is present in a state of perfectly natural emulsion. The proteid or albu-

minoid elements, corresponding to the albumin and casein of milk are practically identical with the casein of mother's milk, and form in the presence of an acid extremely fine and soft curds, which break up with the greatest readiness. In this respect it is even superior to the natural food of the human infant.

In experiments which we have made with nut milk we find that it has a delicate, delightful flavor, with a suggestion of its nutty origin, but resembles cow's milk very closely indeed. It agrees with the most delicate stomachs, and can be taken with perfect impunity by persons who cannot take cow's milk or cream even in the smallest quantities without suffering more or less severely in consequence. Added to cow's milk in proper proportion, lac vegetal, or nut cream, prevents the formation of hard curds in the stomach, as when the cow's milk is used alone. This renders it an exceedingly valuable food for infants,— vastly superior to any infant's food which has been devised.

Nuts are unquestionably the vegetable analogue of meat and other animal foods, not only containing all the food elements to be found in animal products, but in finer and more digestible form, more delicately flavored, and wholly free from the deleterious elements which abound in meat, and which are closely associated with all forms of animal food. Nuts and fruits are stated by the most eminent comparative anatomists to be the natural diet of man, as they are of his primitive relatives, the gorilla, the orang-outang, and the chimpanzee; hence it is not surprising that nuts should prove to be not only a perfect complement to a healthful dietary, but a food which is not only agreeable to the palate but acceptable to the stomach, even when it is so diseased that other less natural foods are rejected.

The general prejudice against nuts on the ground of their indigestibility is the natural outgrowth of the attempt to use them in a perfectly natural state, with no preparation except such as can be given by the teeth. With an entirely healthy stomach and sound teeth, this preparation is generally sufficient, but experience has shown that the digestibility of most nuts is as much improved by artificial preparation and cookery as is that of vegetables and other food-stuffs.

SPECIAL HOSPITALS FOR CONSUMPTIVES.

The medical profession is becoming fully aroused to the fact that consumption is a more dangerous disease than leprosy, being more contagious, and almost equally fatal, unless controlled by special climatic conditions or those which can be received only in a well-equipped hospital. The public is also becoming acquainted with the importance of restricting this disease, which is as certainly communicable as smallpox, diphtheria, or scarlet fever, and which destroys each year, on an average, one seventh of all persons who die, or many more than any other known disease.

More than a century ago, the authorities of Naples, Italy, established a hospital for the cure of patients suffering from pulmonary tuberculosis, or consumption of the lungs. Our state and city authorities are just beginning to recognize the importance of a return to this very proper method of dealing with this dread disease. England has for many years provided for the consumptive poor who are not able to obtain the advantages of a change of climate, and in this manner furnishes at the present time free beds for more than seven thousand such patients.

The following is an abstract from a paper by Dr. J. F. Jenkins, of Tecumseh, Mich.: —

"It is now a well-known fact that wealthy tubercular patients or even those

of moderate means may prolong life, and in a certain percentage regain their former health, by a residence in a suitable climate; or they may receive treatment at home without endangering the public health. But there is in every community a large class of these patients without means; and it is these who are the means of spreading the disease. The state should provide such with proper treatment, and protect the public by having the tuberculous poor conveyed to a hospital devoted to this class of patients.

"Over a century ago England began building hospitals for consumptives, and at present there are eighteen hospitals, containing over seven thousand free beds, for tuberculous patients, the result of which has been to materially lessen the death-rate from pulmonary tuberculosis in that country."

"From statistics taken from the *Progris Medical*, the death-rate in 1870 in England and Wales was 2410 for each 1,000,000 inhabitants; but since consumptives have been treated in special hospitals, this number has fallen to 1468, in 1893. If this report be correct, England saves the lives of 20,000 of her inhabitants yearly, by wise sanitary measures in maintaining special hospitals for her dependent class of consumptives.

"In this country a number of private hospitals and sanitariums have been built for the purpose of caring for this class of patients, and reports from these various institutions show very gratifying results, the number of cures ranging from twenty to forty-five per cent. The Massachusetts legislature has recently appropriated $150,000 for her tuberculous poor.

"The State Board of Health had a bill before the last Michigan legislature asking for an appropriation for this purpose, and it is to be hoped that the next legislature will do so. Money used in such ways comes back to the people many fold."

The management of the Battle Creek Sanitarium has recently established a finely equipped sanitarium at Boulder, Colo., where special attention is given to the treatment of those suffering from lung troubles, in connection with the general work of a sanitarium. The institution is a self-supporting philanthropy, and consequently cannot be wholly devoted to the treatment of the sick poor, but all its surplus earnings will be used in this manner, and as soon as possible, quite extensive provisions will be made for this class. Here is a most excellent opportunity for persons charitably inclined to make investments in the interests of suffering humanity.

While but a small proportion of cases of lung disease can be cured in the East, it is unquestionably true that an altitude of five thousand feet is of immense advantage in the treatment of this insidious malady. More than twice as large a proportion of cures can be effected than at lower levels. We expect to see the work at Boulder develop into a great philanthropy in the interests of this class of sufferers.

Good News for Women.— The surprising news comes from Paris that the fashionable women of that fashionable city, who set the styles for the whole world, have demanded an increase of waist-room to the extent of three or four inches, and that the next season's fashion plates will be especially characterized by largeness of waist. The modistes have at last discovered that the Venus de Milo rather than the French corset is the proper model as regards a woman's form. This wonderful change is said to have been brought about by the addiction of the "new woman" of France to the use of the bicycle. The tips of the handles of the breathing bellows are placed at the waist, and waist-constriction thus effectually interferes with respiration. The lady bicyclist who wishes to keep up with the procession must enjoy free movement for her respiratory machine, as well as

for her pedal extremities; and consequently she has rebelled against waist constriction so far as to construct a special dress for bicycle-riding and other modes of outing; and after the enjoyment of the freedom thus obtained, she refuses to go back into her cage. If American women will show themselves as ready to adopt the new Parisian dress reform as they have heretofore been to imitate every folly emanating from the stage and the demi-monde of gay Paris, we shall witness within the next six months a mighty revolution in the conventional styles of dress in this country. Fashion-makers can do more in a week in the reformation of women's dress than all the doctors, dress-reform clubs, lecturers, and other reform agencies can accomplish in half a century. Women may well rejoice in the prospect of a time when they will have a chance to "breathe like a man" without being criticized as being "mannish."

The Source and Nature of Potential Energy Utilized for Muscular Labor.— Professor Chauveau, in connection with Drs. Tissot and De Varigny, recently presented before the Academy of Sciences in Paris, an exceedingly interesting study of the above subject, which shows that the potential energy directly utilized by the muscles of the laborer and of the fasting man is never furnished by fat, but that it is derived by the muscles directly from the carbohydrates, the muscular work gradually exhausting the store of glycogen and glucose, the source of this potential energy.

The muscular energy is maintained by the transformation of fats into carbohydrates, which in turn become the source of energy. So the fats are thus used indirectly as a means of supporting muscular work, but only after they have been assimilated. The experiments made show that even when the blood is saturated with fatty elements introduced by digestion, no portion of the same is utilized for muscular work except such as has been assimilated, or incorporated into the tissues of the body. These experiments furnish an indirect proof that alcohol cannot be a food or a source of energy, since no evidence has ever been afforded that alcohol, either without or within the body, can be converted into glycogen or glucose, from which the muscles derive their energy. If the body cannot utilize the energy of natural food substances, like fat, until after it has been assimilated and converted into carbohydrates, it could not be expected that alcohol, an artificial, unnatural substance, a product of the action of micro-organisms in the decomposition of food substances, could be thus utilized without first being assimilated; and since it cannot be assimilated, the fair conclusion is that it cannot be used at all.

Reviews.

Principles of Bacteriology.— By A. C. Abbott, M. D., Philadelphia, Lea Brothers & Co.

This practical manual of bacteriology for students and physicians has reached its third edition within four years of its first publication, an evidence, certainly, of the great favor with which it has been received by the profession. The work is not merely a technical description of bacteria, but an elaborate treatise, intended to serve as a complete manual for the laboratory. The descriptions of methods and technique are extremely lucid and complete. The illustrations are excellent. Dr. Abbott has had an extended experience in bacteriology as first assistant in the laboratory of hygiene in the University of Pennsylvania, one of the most amply equipped institutions in the world. This edition of the work has been thoroughly revised and considerably enlarged, and is fully abreast with the present status of the rapidly growing subject of bacteriology. We know of no other work which we can more heartily commend as a student's manual.

Ptomains, Leucomains, Toxins, and Antitoxins; or the Chemical Factors in the Causation of Disease.— By Victor C. Vaughn, Ph. D., M. D., professor of Hygiene and Physiological Chemistry, and Frederick G. Novy, M. D., junior

professor of Hygiene and Physiological Chemistry in the University of Michigan. New (3d) edition. In one 12mo. volume of 603 pages. Cloth, $3.00. Philadelphia, Lea Brothers & Co., 1896.

The names of the authors of this work are a sufficient guarantee of its accuracy and its practical value. It stands alone, so far as we know, as an exhaustive treatise upon the subject of bacterial poisons, and is invaluable to English readers as the only accessible work affording reliable information upon this subject of growing importance. It should be read and studied by every physician as well as by medical students. No physician at the present time can pursue the practise of medicine in an intelligent manner without a knowledge of the important facts presented in this work. That a large measure of appreciation is accorded it by the medical profession is shown by the fact that it has already reached its third edition. The authors deserve, in addition to the reward of a large circulation for their work, the thanks of the profession for the enormous amount of painstaking research and original investigation which has enabled them to produce this elaborate treatise. We are glad to note that the present edition includes a very excellent summary of the important facts presented in Bouchard's admirable work, "Les Auto-Intoxications."

The Changes in the Proportions of the Human Body during the Period of Growth.— By W. S. Hall, Ph. D., M. D., Chicago, Ill.

Dr. Hall, the author of this pamphlet, has had exceptional opportunities for the study of the bodily changes durin g growth, from the standpoint of the physiologist, and has, in this paper, made an exceedingly interesting summary of the enormous amount of data which he has collected, from which he has deduced several important and interesting laws. As relates to growth, the author has discovered that "when the vertical dimensions of the human body is undergoing an acceleration of its rate of growth, the horizontal dimensions undergo a retardation of their rate of growth; and the reverse." In a study of the relation of lung capacity to weight, to volume, and to strength, the author concludes that "the lung capacity varies with the strength." Whether or not the latter law is true, we are somewhat in doubt, as the tests of muscular strength were not sufficiently thoroughgoing to give a true idea of the total strength of the body, the tests being applied only to the back, the extensor muscles of the thigh, the pectoral muscles, the flexor muscles of the forearm, and the extensor muscles of the upper arm. A more extended study of this subject by the aid of data obtainable by a dynamometer capable of measuring the strength of each of the principal groups of muscles might give different results.

Vaginal Hysterectomy.— By Francis D. Holbrook, M. D., Chicago, Ill.

This paper describes what is known as "Pratt's Method of Vaginal Hysterectomy." The method seems a satisfactory one, although we do not know to what degree Dr. Pratt is rightfully entitled to his claim of originality.

Syphilis of the Vital Organs, and the Third Act of the Drama of Syphilis.— By Henry Alfred Robbins, M. D., Washington, D. C.

These two papers, reprinted from the *Virginia Medical Monthly*, indicate very clearly that the author is master of his subject, and give evidence of extended bibliographical research in addition to clinical observation.

The Experience of Several Physicians with Sero-Therapy in Tuberculosis.— By Paul Paquin, M. D., St. Louis, Mo.

Dr. Paquin is an enthusiastic student of serum-therapeutic treatment in tuberculosis, and has done a large amount of painstaking work in the interests of this new therapeutic procedure. A number of cases are reported in this paper in which the remedy seems to have been helpful.

The Frequent Dependence of Insomnia, Mental Depression, and Other Neurasthenic Symptoms upon Disease of the Gastro-Intestinal Tract.— By Boardman Reed, M. D., Atlantic City, N. J.

This excellent paper contains the practical experience of a practical man, who enjoys exceptional opportunities for observation of the class of invalids of which he writes. Dr. Reed has made a careful study of the disorders of the gastro-intestinal tract, both in this country and in Europe. Notwithstanding the demands of an enormous private practise, he finds time for the careful scientific research upon which he bases the conclusions presented in this paper. This subject is one which ought to be more carefully studied. Thousands of patients are being treated by neurologists for disorders of the nerves, without success, who might easily be relieved ot their sufferings and the disturbing symptoms present, by a recognition of the fact that the great majority of functional nervous disturbances are merely the expressions of a disordered intestinal tract. The sooner physicians find out that neurasthenia is not a disease, but a symptom of disordered nutrition, the better it will be for a multitude of sufferers who are now being "toned up" and "toned down" by "nerve fooling" remedies of various sorts, which afford temporary relief only at the expense of incurring greater suffering in the end, and rendering the disordered conditions present more persistent and difficult of cure.

The Battle Creek Sanitarium
LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORT OF EXAMINATION OF BLOOD.

R AUGUST.

Blood Count.	Men.	Women.	Total.
Over 5,000,000	1	1	2
Between 4,500,000 and 5,000,000	88	16	104
" 4,000,000 " 4,500,000	16	44	60
" 3,500,000 " 4,000,000	2	8	10
" 3,000,000 " 3,500,000	1	2	3
" 2,500,000 " 3,000,000	0	1	1
" 1,500,000 " 2,500,000	4	0	4
Totals	112	72	184

Hemoglobin.	Men.	Women.	Total.
100 per cent.	71	46	117
93 " "	18	27	45
85 " "	6	8	14
78 " "	1	2	3
71 " "	1	0	1
65 " "	1	0	1
57 " "	3	0	3
Totals	101	83	184

Gastric Laboratory Report for August.— Regular analysis, 205; experimental, 8. The cases are from the following States and countries: Michigan, 41; Illinois, 38; Ohio, 27; Iowa, 15; Nebraska, 9; Indiana, 9; Texas, 7; Minnesota, 6; Kansas, 5; Kentucky, 5; Pennsylvania, 5; South Dakota, 4; Tennessee, 3; New York, 3; Vermont, 3; Wisconsin, 3; Louisiana, 2; Massachusetts, 2; Colorado, 2; California, 2; Alabama, 2; Canada, 2; Georgia, 2; District of Columbia, 1; West Virginia, 1; North Carolina, 1; North Dakota, 1; Connecticut, 1; Idaho, 1; Montana, 1; New Zealand, 1. Total, 205.

Bacteriological Examination of Stomach Fluid for August.— Total number of examinations made, 223. Eight of these were experimental.

Seventy-four injections were made into guinea-pigs of bouillon cultures from stomach fluids, in amount varying from 2 to 6½ c.c. Death occurred in 24 cases; mortality, 32 per cent.

Sputum Examinations for August. — There were 39 examinations made, 33 of which were of new cases. Tuberculosis bacilli were found in 8 cases, 5 of which were new.

Urinary Laboratory Report for August.— Number of specimens examined, 368; number of cases, 300. Number of cases in which blood was found, 7; albumin, 23; pus, 66; casts, 4; sugar, 7; bile, 5. Number of cases tested for toxicity, 16; number of specimens tested for toxicity, 18.

WELLCOME LIBRARY INSTITUTE

PUBLISHERS' DEPARTMENT.

THE Tri-State Medical Society, of Alabama, Georgia, and Tennessee, will hold its next annual meeting at Chattanooga, Tuesday, Wednesday, and Thursday, Oct. 13–15, 1896.

The program already includes twenty-nine interesting papers by eminent physicians, and is still growing.

THE PAN-AMERICAN MEDICAL CONGRESS.—Through the energetic efforts of Dr. Charles A. L. Reed, Secretary of the International Executive Committee, and others, an arrangement has been made for a Pan-American Medical Congress to be held in the City of Mexico, Nov. 16–19, 1896. The vigorous manner in which arrangements for this congress have been pushed has already secured a splendid program, and there is every reason to believe that the meeting will be a most unqualified success. Those physicians who had the pleasure of attending the meeting of the American Public Health Association held at the City of Mexico a few years ago will be happy to embrace this opportunity to renew their acquaintance with our affable and warm-hearted Mexican confrères. Certainly no scientific body has received a more cordial welcome or a more brilliant reception than was accorded the American Public Health Association, and without doubt the Pan-American Medical Congress will be equally well treated. Dr. Reed announces the following arrangements respecting transportation :—

"Dr. H. L. E. Johnson, 1400 L street, N. W., Washington, D. C., has been elected chairman of the special committee on transportation. All communications relative to rates, reservation in the special trains, etc., should be addressed to him. A rate of one fare for the round trip has been secured between St. Louis, New Orleans, and other trans-Mississippi points and the City of Mexico. It is confidently expected that this rate will be extended over the entire territory of the United States. Arrangements are in progress for a splendidly equipped train of sleeping and observation cars, with first-class dining-car service. Dr. Johnson will presently be in position to announce a rate, which will include railroad fare, sleeping and dining car service both ways and in the City of Mexico, and covering the expenses of various side trips to the most important historic points in the republic."

DR. W. J. HARRIS, a surgeon of St. Louis, Mo., desires to announce his removal from 3107 Morgan street to 3514 Lucas avenue, of the same city.

Ladies' Guide in Health and Disease

GIRLHOOD,
MAIDENHOOD,
WIFEHOOD,
MOTHERHOOD.

BY J. H. KELLOGG, M. D.,

Member of the American Medical Association, American Public Health Association, American Microscopical Association, American Association for the Advancement of Science, American Association for the Advancement of Physical Education, The Society of Hygiene of France, International Periodical Congress of Gynecology, Editor of Modern Medicine, Superintendent of the Battle Creek (Mich.) Sanitarium.

Every physician has sometimes felt the need of a work relating to woman and her physical relations, written in untechnical language, which he could place in the hands of his lady patients as a means of communicating to them information respecting the special functions of their sex, thereby enabling them to better co-operate with him in his efforts to restore them to physical soundness. This work is admirably adapted to meet this need. It has already served a like purpose in thousands of instances, and has the hearty commendation of hundreds of physicians.

It tells mothers *just what they ought to know*, and daughters who value their health, cannot afford NOT to know what this book teaches them. The work is appropriately illustrated by means of **28 chromolithographic plates, cuts and colored plates.** Complete in one volume of 672 octavo pages, printed on fine paper, and beautifully and substantially bound.

Cloth, embossed in gold and jet, **Half Morocco, gilt edges,**
Leather (library style), **Full Morocco, gilt edges.**

MODERN MEDICINE PUB. CO.,

65 Washington St. *BATTLE CREEK, MICH.*

DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M D., Superintendent.

IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

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COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.

A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

COLORADO SANITARIUM,

BOULDER, COLO.

W. H. RILEY, M. D., Superintendent.

THIS institution is located on a beautiful site of one hundred acres, including a fine mountain peak, and commanding extensive landscape views which, for variety and beauty, can hardly be equaled. The site adjoins the thriving city of Boulder, and is about one hour's ride by rail from Denver, the streets and principal buildings of which are easily discernible from the peaks around Boulder. The equipment consists of a large building especially erected for the purpose, two fine cottages, and every appliance for the application of hydrotherapy, and for the special treatment of pulmonary ailments, to be found in the best establishments of like character. Particular attention is given to the dietetic treatment of patients, and to systematic exercise, in addition to the special treatment for specific ailments. The altitude is between five and six thousand

Directory of Sanitariums.—Continued.

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STATE OF JALISCO, MEXICO.

D. T. JONES, Superintendent.

ADDIE C. JOHNSON, M. D.,
J. H. NEALL, M. D., } Physicians.

THIS institution, established in 1894, is the first and still the only one of the kind in Mexico. It affords, in addition to the unsurpassed climatic advantages of the region in which it is located, facilities for the employment of hydrotherapy, electricity, massage, manual Swedish movements, and dietetics, in the treatment of all forms of chronic disease. The altitude is the same as that of Denver,—from five to six thousand feet. Guadalajara has the advantage of a climate more nearly uniform than any other with which we are acquainted. Located in the tropics, it enjoys almost perpetual sunshine, while its altitude is such as to prevent excessive heat. There is probably no better place on earth for a pulmonary invalid. It is only necessary that the advantages of this institution should become known to secure for it extensive patronage.

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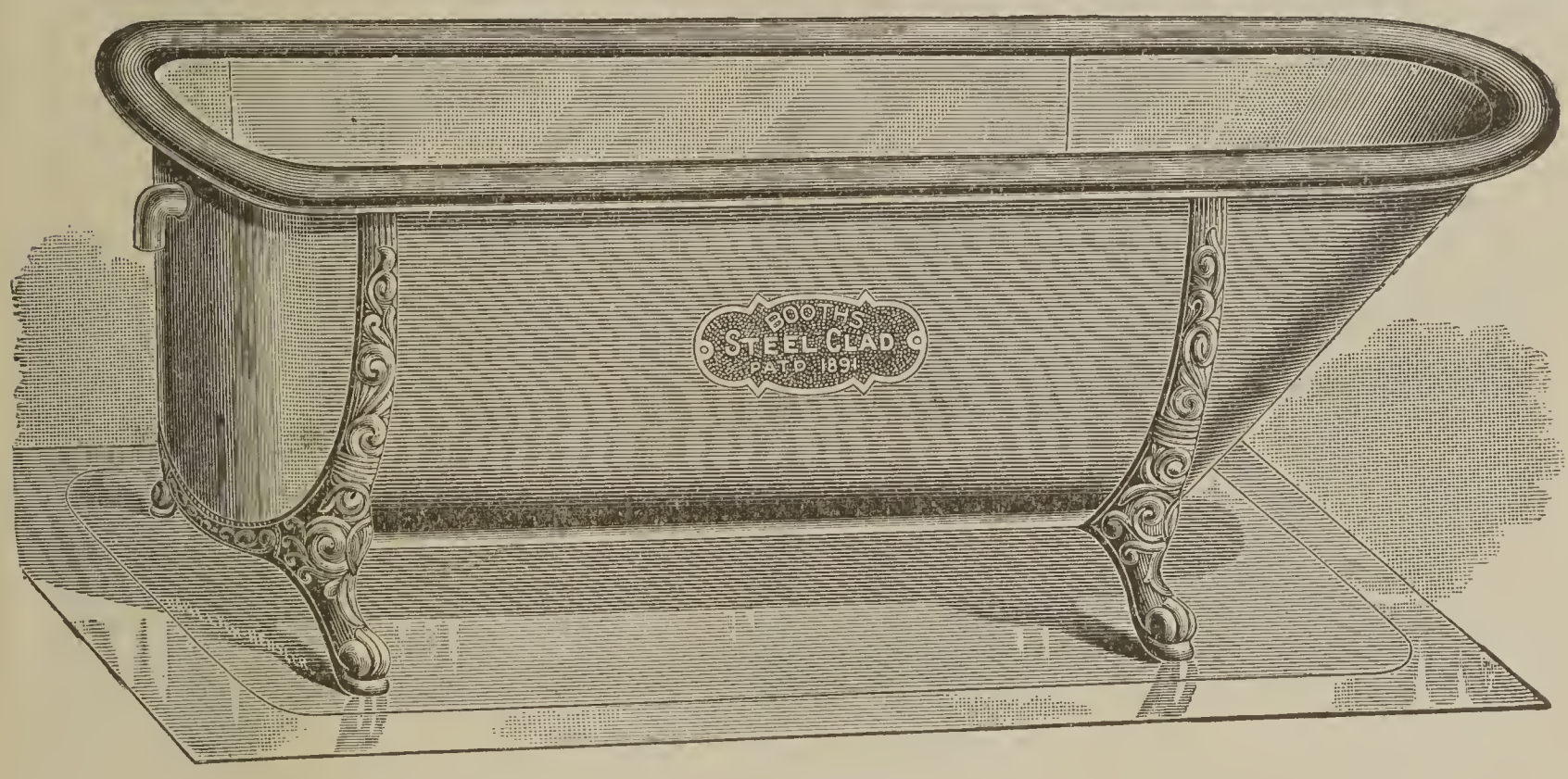

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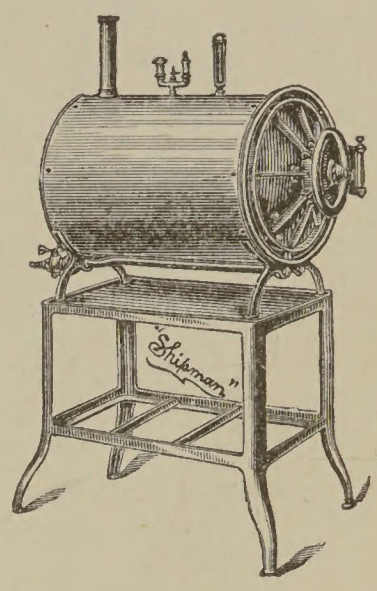

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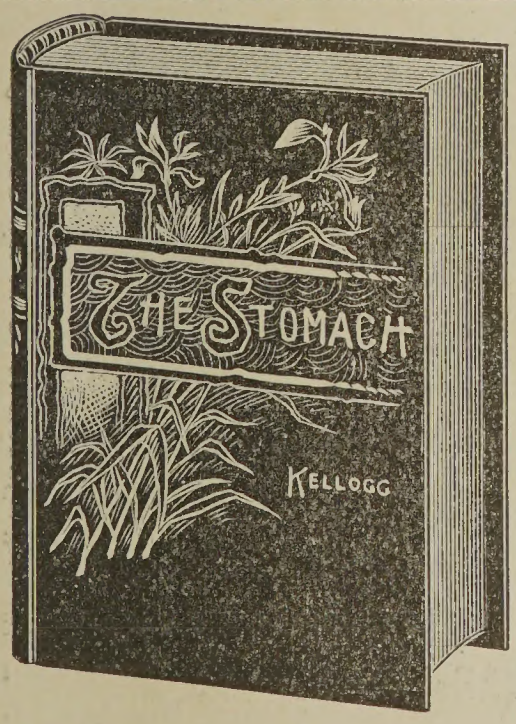

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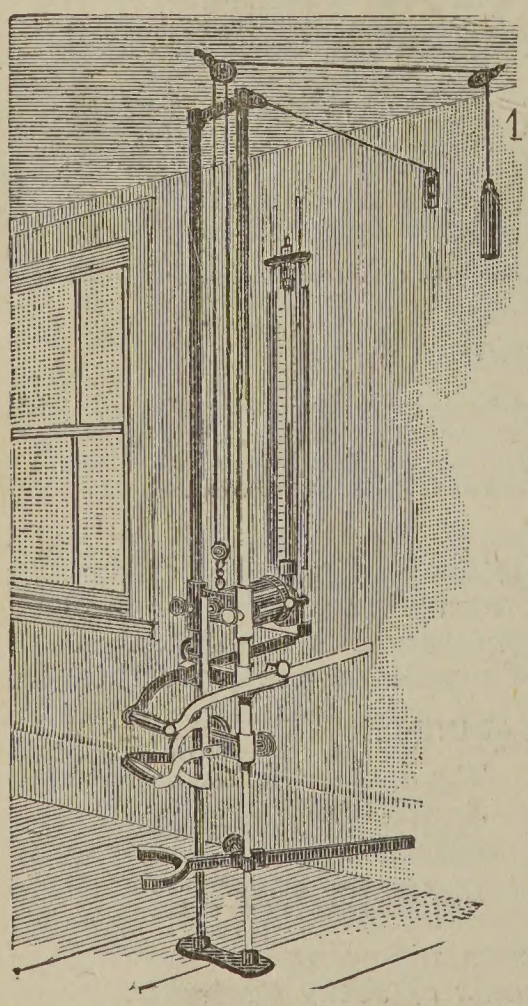

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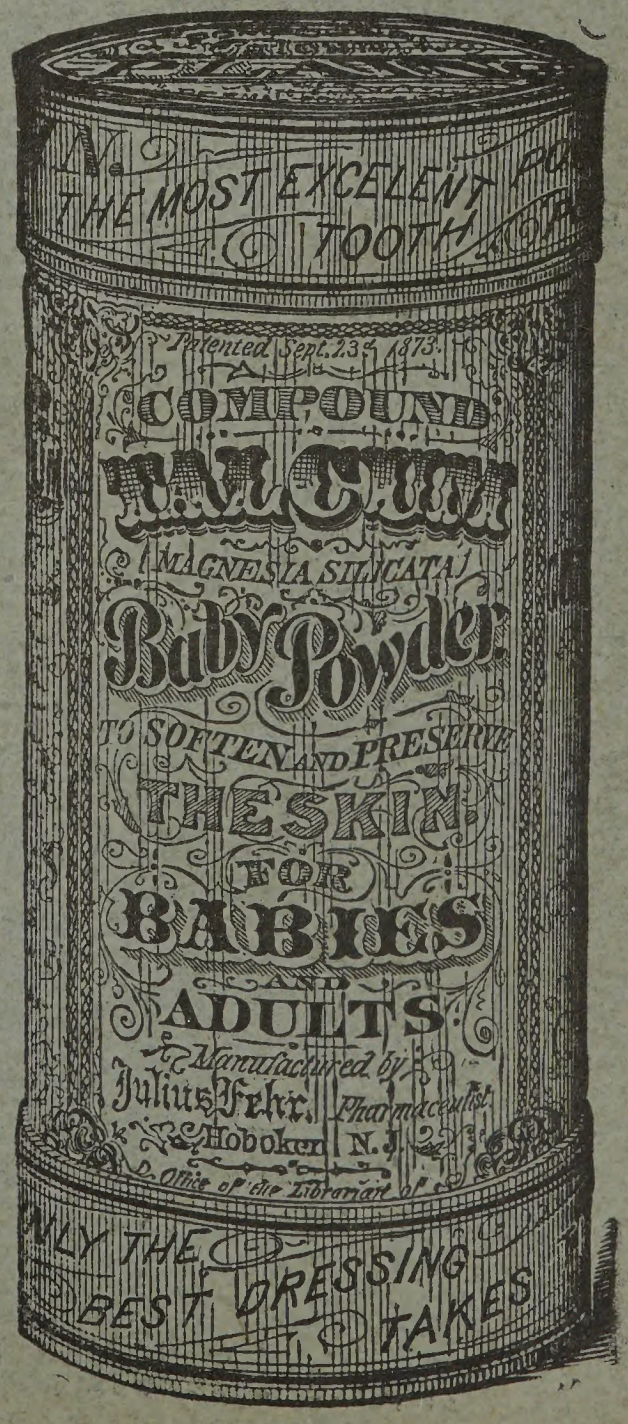

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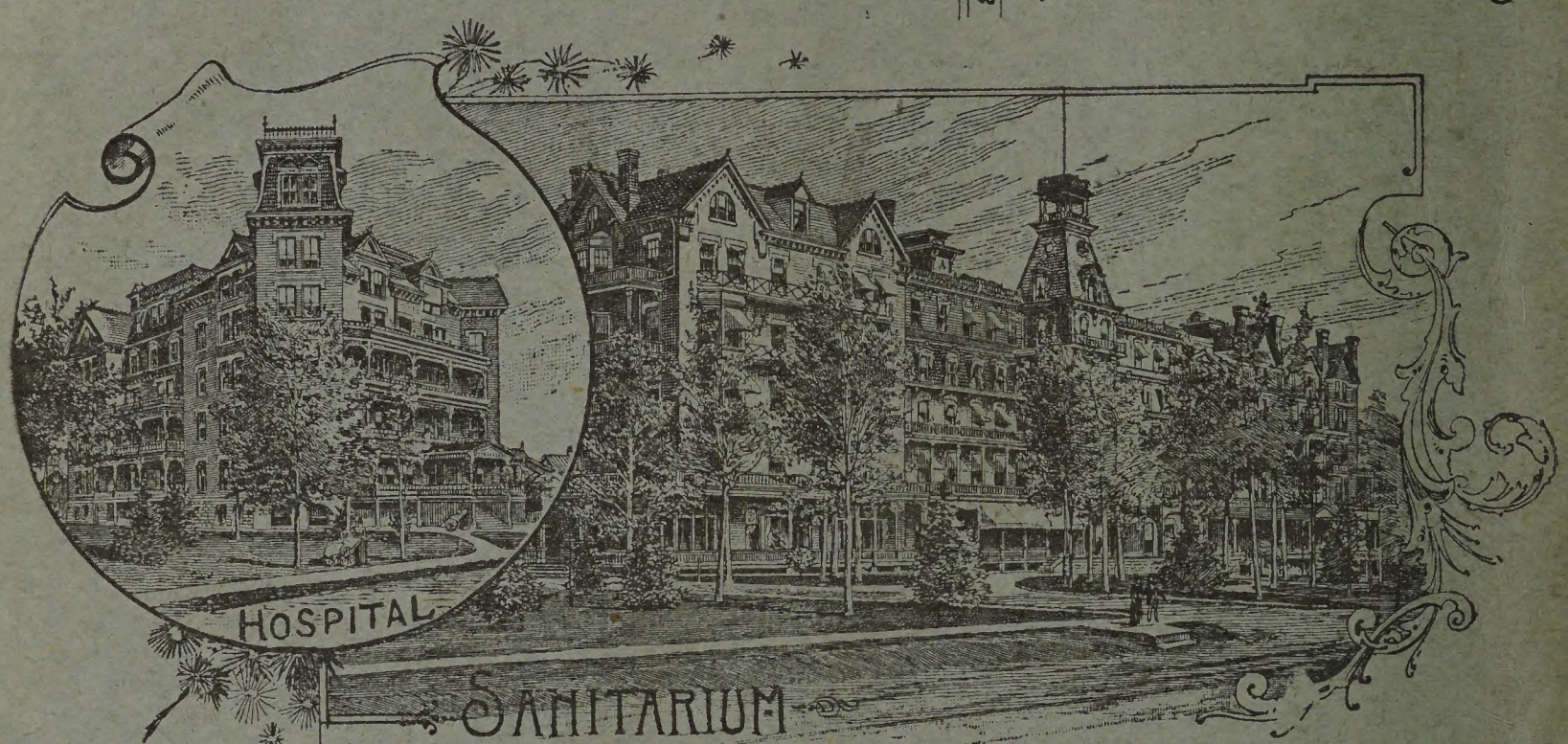

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